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ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES

A YEARLY REPORT OF THE PROGRESS OF THE GENERAL
SANITARY SCIENCES THROUGHOUT THE WORLD.

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CEREBRAL AND SPINAL LOCALIZATIONS.

Proof of Excitability of the Cortex Cerebri.—To settle this question, Carbalho⁴⁷⁹_{No. 10} devised the following experiment: After determining the excitability of the motor area in dogs in the usual way, a pledget of cotton soaked in 5 per cent. solution muriate of cocaine was placed upon it for a few minutes, when it was found that it had lost its excitability. On removing the cortex, the subjacent white matter was found normally excitable. This is in striking conflict with Goltz's idea²⁴⁶_{Bd. 42, p. 465} that only the white substance of the brain is excitable, and that electrodes must penetrate at least four millimetres in order to produce signs of irritation.

Lesions of the Motor Zone Generally.—Horsley⁴⁷_{Apr.} presents a most interesting autopsy showing focal lesions (hæmorrhagic) due to thrombosis of the longitudinal sinus. As the report of the symptoms rests only upon the testimony of nurses, we cannot admit that the case has any value for scientific purposes.

Influence of Cortex on the Salivary Secretion.—Bechterew and Mislawski⁶⁸_{Oct. 15} have verified Lépine and Rochefontaine's results⁵⁵₁₈₇₅ to the effect that faradization of the frontal lobe in dogs causes an increase of salivary secretion analogous to that produced by excitation of the chorda tympani. They found that the most related gray matter was the fourth gyrus, next the fissure of Sylvius.¹²⁰³_{p. 244, '96} The increase of saliva was most marked on the same side as the irritation.

Convulsions and Hyperpyrexia from Chemical Irritation of the Cortex.—Landois⁶⁹_{Oct. 15} relates the following highly instructive experiment: A dog's skull was opened and the region of the crucial fissure exposed. Powdered kreatin was sprinkled upon the right post-crucial gyrus. After a short period of unrest and

general muscular excitement a convulsion began, after thirty-six minutes, in the left forepaw (Jacksonian spasm) and rapidly spread to the whole body, constituting an extremely severe epileptic paroxysm lasting more than six minutes. In the course of one and one-half hours numerous severe spasms occurred, some with episthotonus, leaving the animal comatose and deprived of reflexes. The temperature had meanwhile risen to 45° C. (113° F.). Death occurred in about two and one-half hours with a temperature of 42.3° C. (108.1° F.). The cervical muscles were the seat of strong cadaveric rigidity in three minutes after death. The post-crucial gyrus and the cerebral surface for two or three millimetres (five-sixths to one and one-quarter inches) further caudal were found highly injected. The author attributes the high temperature partly to the enormous muscular work and partly to the terminal paralysis of the central nervous system.

Atrophy of Cerebral Gyri from Disuse.—Sharkey⁴⁷_{Apr.} reports a case in a woman, aged thirty-seven, in whose brain very marked atrophy of the motor zones of the brain was found three years after the beginning of a paralysis due to caries of the last two cervical and first three dorsal vertebræ. No histological changes were found in the atrophied gyri; it was simply a quantitative change from disuse (?). This case is in striking contrast with the almost negative results of autopsies after old amputations, yet the cases are different, as in the latter condition volitional impulses (unconsciously, perhaps) would still be able to flow out from the motor cortex to the anterior cornua of the whole cord.

Changes in Convolutions after Amputations.—Arnozan¹⁸⁸_{June 24} reports a negative case in a subject, aged sixty, who, seven years before death, had had his left forearm amputated. The relatively short time after the operation and the age of the subject might serve to explain the absence of atrophic changes in the internal capsule and in the central convolutions. The brain was of interest as exhibiting on both (?) sides a bridging gyrus between the pre- and post-central gyri. The figure appended to the paper is very suggestive of imperfect development of the whole brain, and it is to be regretted that a full history of the patient is not given.

Results of Removal of One Hemisphere in Dogs.—Goltz,²⁴⁶_{Bd. 42, p. 419} in his sixth contribution to the physiology of the cerebrum, reports an extraordinary experiment in which he succeeded by three oper-

ations (December, 1885; February, 1886; March, 1886) in removing the whole of one hemisphere of a dog, leaving only a stump consisting of part of the thalamus attached to the crus. This dog was shown at the meeting of German neurologists and alienists at Strasburg in June, 1887, and immediately afterward killed for examination. Many observations of the highest interest were made upon this animal. Goltz claims that the paresis at first shown by the dog diminished so much that only a trace of weakness or awkwardness remained. He concludes that an animal who has lost his left hemisphere can voluntarily move all his muscles, though it is with greater effort that he moves those on the side of the lesion. He preferably uses his left limbs, and rather tends off to the left. Even in such an act as micturition he can lift either leg; he would rather use the left forefoot to dig for a concealed bone, but can use the right. He can sit up on both hind legs, but awkwardly on the right. Sensibility is slightly diminished in the right half of the body, all forms of sensibility about equally. He denies that the "muscular sense" is especially affected. With respect to the special senses the distinguished author's statements are less positive, and the tests recorded rather unworthy of his reputation. He acknowledges having made no tests of smell and taste. The tests for hearing were of the crudest, and no attempt appears to have been made to stop the right auditory meatus with wax or clog. Vision is said to have been impaired in the right eye, in the shape of hemiamblyopia and "weakness of cerebral vision." In tests for vision no severe technical attempts were made to test the fields of vision; even closure of the left eye is not mentioned. It is stated that the dog cleared obstacles quite well (which would be compatible with hemianopsia), and that he noticed a piece of meat placed in front of him. Yet, further on (p. 458), Goltz states that a dog can *smell* a piece of meat covered by several centimetres of earth. The intelligence of the animal was reduced. A most extraordinary statement is made to the effect that an electrical experiment on the remaining hemisphere was not made (as it should have been), because it is well-known that when so-called motor centres are faradized, after the irritation reaches a certain degree, convulsions are produced. A still more singular statement is made (p. 427) when it is said that the animal did not perceive objects as well as when their image was thrown upon the right

half of its retinae; in other words, that left hemiambyopia was present. This is an absolute contradiction to all our accumulated knowledge; there must have been partial anaesthesia of the right halves of the retina (if any) and right-sided hemiambyopia. A part of this portion of Goltz's paper is devoted to condemning the doctrine of motor centres as obsolete and disproven. On the whole, with all due respect to the author's position, this contribution can only give rise to doubt as to his qualifications as an observer, and to a certainty that he disregards in the most unscientific spirit what we have learned from experiments on monkeys and from clinico-pathological observations on man, which absolutely demonstrate the existence of motor and sensory areas.

Results of Removal of the Whole Brain Except One Occipito-Parietal Lobe.—Goltz,²⁴⁶
Bd 32, p. 419 No complete paralysis and only slight anaesthesia observed (dog). Almost total blindness, with very sluggish reaction of the pupils. Loss of hearing almost if not quite complete, though one entire "acoustic centre" remained. Taste greatly impaired (the animal ate dog's flesh as well as horse's meat). Smell abolished by lesion of olfactory tracts.

Lesions of the Frontal Lobe.—The semeiology of lesions of the pre-frontal segment of the human brain is as yet shrouded in mystery. It is certain that large lesions of these lobes may exist, even with the loss of brain-substance through a wound, without any symptoms (except general epileptiform attacks due to the implication of the dura). Any observations by reliable observers which may throw light on this subject are very welcome. Jastrowitz, of Berlin, in his remarkable essay,¹²⁰⁴ reports three cases with autopsies of tumor of one of the frontal lobes (frontad of the pre-central gyrus) in which a cheerful, mocking form of insanity (moria) with and without epileptic attacks and hallucinations of sight and hearing constituted a remarkably uniform symptom-group. He refers to a case recorded by Longet in his "Physiology," and to cases by Baraduc and by Wilks, also to results of extirpation by Goltz²⁴⁶
Bd 33, p. 419 and Loeb²⁴⁶
Bd 33, p. 419 in support of his theory, viz.: that in lesions of the frontal lobes we meet with symptoms of an exalted or optimistic nature, a merry, mocking, critical mental state, with or without diffused physical symptoms and frontal pain. He admits that in some cases of lesion of the frontal lobes, a dismal, fearful mental state has been observed. In

none of Jastrowitz's cases was a diagnosis made before death, and it cannot but be added that the physical or objective examination of the patients was very imperfect or wholly wanting, a fault which the author apologizes for on the ground of the patient's mental state, yet there seems hardly any reason why the state of the pupils and of the fundus oculi should not have been determined. I have had under observation for three years a case of gunshot-wound of the left frontal (supraorbital lobe, with loss of about twenty-five or thirty grammes of brain-substance, and secondary general epilepsy without motor symptoms, which has been characterized by perfect preservation of the mental faculties and moral attributes. L. Welt³²⁶_{Bd. 2, p. 4} attempts to show from a case of her own observed in the Zürich Hospital, and from a review of other cases, that a change in character follows lesions of the frontal lobe, more especially of the ventral part of the first frontal gyrus and of the orbital gyri. She herself quotes a case in which no morbid change occurred. Goltz²⁴⁶_{Bd. 42, p. 439} relates the results of extirpation of both frontal lobes (including, of course, the motor zones) in a dog, who survived four months. A peculiar feature was a tendency to run or gallop forward. Voluntary eating was abolished, though if food was placed in the mouth or the nose dipped in milk, chewing and swallowing movements ensued in a normal way. No actual paralysis was evident. Dogs thus operated upon absolutely lose the ability to present the paw on command, whereas dogs whose occipital lobes have been extirpated are still able to do this if assisted by touch. Removal of the frontal lobes also leads to irritability and ugliness of temper.

J. C. Shaw⁵⁹_{Jan. 25} presented to the New York Neurological Society a specimen of glioma of the superficial aspect of the right motor zone, involving the ventral part of the pre-central and the caudal extremities of the second and third frontal gyri. Depth of tumor not determined. Symptoms: Jacksonian spasms, beginning in left face and neck, with deviation of eyeballs; later spasms of left arm and general spasm convulsions, preceded by painful sensations in roof of mouth and teeth; headache later, and still later left hemiparesis with slight tactile anaesthesia. No laryngeal symptoms noted. First spasm in 1879; choked disk found in 1886; death in 1887.

Lesions of the Temporal Lobe.—Edes⁵⁰_{July 28} reports an interesting

case, which is, however, shorn of much of its value by omissions in observation. Female, aged fifty-one, formerly subject to migraine, in 1886 began to have epileptiform attacks, in which, after a short loss of consciousness, there were confusion and amnesic aphasia (from context there appears to have been also paraphasia); later convulsive movements not specially localized were observed. Paragraphia as well as paraphasia occurred later. No distinct paralysis, though the right foot was less well used in the last few weeks; there was also a distinct tendency to turn to the right. Death occurred by coma rapidly developed in one day. No motor aphasia or ataxia existed. The autopsy revealed a tumor four centimetres in diameter; a spindle-celled sarcoma was found under the fourth temporal gyrus penetrating to the floor of the posterior horn of the lateral ventricle; some slight neuroglia changes were found in sections made of the insula. Most unfortunately, the ophthalmoscope was not used for thirteen months prior to death (January, 1888), and no test was made of fields of vision. The author assumes that, if there had been hemianopsia, the patient would have been aware of it, which is in direct contradiction to experience: patients are almost invariably amazed at the demonstration of their half-blindness. The tendency to the right is strongly suggestive of hemianopsia, which I think must have been present, for, besides the above reasons, the tumor was so placed as to necessarily impinge upon the left fasciculus opticus in the substance of the hemisphere. The lesions found in the cortex of the insula do not seem of usual importance, and the aphasic symptoms can be all explained by interference with the nutrition of the first temporal gyrus (left side) and its associated white fibres. It is also much to be regretted that taste and smell were not tested.

Bernheim¹⁸¹_{Apr. 15} relates a case of large sarcoma involving the left inferior parietal lobule, the gyrus angularis, and the caudal two-thirds of the temporal gyri. No ataxia, word-deafness, or motor aphasia was present, but a marked verbal amnesia existed. The case is wholly deprived of its apparent value by the absence of statement as to whether patient was right or left-handed, by lack of examination of sensibility (muscular sense especially). For a remarkable negative case of destruction of right temporal lobe (by Van Merriis) see *negative localization cases*; Edes'⁶¹_{Oct. 27} case of sar-

coma situated on the left occipito-temporal lobe between the fourth temporal gyrus (lobus fusiformis) and the posterior horn of the ventricle. There was a secondary lesion of the insula, which was swollen and pale, with histological changes in its cortex. Symptoms during life: Epilepsia major et minor; many attacks, followed by temporary aphasia and slight hemiparesis; not much headache; no hemianopsia; aphasia and paretic symptoms more marked before death.

Senator³⁰⁹_{v.13} performed an autopsy which unexpectedly revealed an abscess of the left temporal lobe. During life no disorder of speech or of hearing (except tinnitus) had been observed. The case is of importance as bearing on recent views of the function of the first and second temporal gyri, because the patient was left-handed (as were several members of his family and his own two children).

Franks¹⁶_{Feb.1} presented to the Royal Academy of Medicine a most interesting specimen of cyst of the left temporal lobe, about two inches in diameter, its anterior edge being one and a half inches from the Sylvian fissure (auditory centre not directly involved). No trace of tumor or of hæmorrhage was found. During life, headache, epileptiform attacks, vomiting, amnesic aphasia, slight paresis of right sixth and seventh nerves, and coma were the principal symptoms. During exacerbation of pain and vomiting the pulse became very slow. A surgical consultant was strongly of the opinion that trephining should be done over Broca's convolution (?). As the aphasia was not motor and there was no distinct hemiplegia this suggestion was hardly logical. Still, the idea prevalent in the interesting discussion which followed was that exploratory trephinings should have been done early in the case. It would seem to have been an unusually favorable case for cure had a correct diagnosis and good operation been made.

Lesions of Parietal Lobe.—Under the title of "Focal Lesions of the Inferior Parietal Lobule," Wernicke³⁰⁸_{Bd.29,II.1} reports a case which presented left hemiparesis with remarkable loss of muscular sense, also left lateral hemianopsia and left-sided diminution of hearing. Prominent but not permanent was conjugate deviation of the eyeballs to the right. The autopsy revealed a fresh focus of softening in the right inferior parietal lobule and gyrus angularis, a fresh lesion of the right nucleus lenticularis involving the internal capsule,

and an older lesion of the right half of the pons at the junction of its upper and middle thirds. The author attempts to draw conclusions as to the source of ocular deviations from this and other cases, but as the case is one of multiple lesions, and conjugate deviation occurs with lesions of various parts of the hemispheres, these must be received with doubt. The real value of the observation lies in that it adds one more to the cases which go to show that a centre for memory of motor acts (muscular sense) exists in the lower parietal lobule.

Lesions of the Occipital Lobe.—Jensen²⁹⁵_{B4,45,B.1} relates a most remarkable case of idiocy in which the autopsy showed a total destruction of the whole of the left occipito-temporal lobe, almost as defined as in Schäfer's experiments on monkeys (*vide* p. 14). Unfortunately, the case is worthless because no physiological data are given in the history, which is of the gossiping sort so common in institution case-books. Goltz²⁴⁶_{B4,42,p.453} relates at length his experiments on removal of both occipital lobes in dogs. He finds that, as compared with dogs whose eyeballs have been removed (and which are consequently simply blind), the subjects of his experiments exhibit only marked amblyopia and dementia. The animal with uninjured brain rejects dogs' flesh, comes quickly to one who calls him, readily finds food placed near him, etc. Going down steps from the kennel is easy for the blind dog, but difficult and unpleasant for the dog with injured brain. A most interesting experiment was made by means of a bridge about seven feet long made up of slats two and a half inches wide, separated by an equal distance. Over this bridge a normal dog ran quickly and safely, a dog blind from loss of eyeballs walked over it carefully but safely, the hind feet seeming to know what the fore feet learned by tactile sensation. On the other hand, the dog whose occipital lobes had been removed fell helpless on the bridge with his legs hanging through, and could go no farther. In other words, the dog with injured brain was much more helpless and stupid; he did not hear, smell, or feel as well. Removal of the frontal lobes leads to irritability and ugliness, whereas removal of the occipital lobes is followed by abnormal quietude and gentleness. As regards vision, Goltz is a little uncertain; he does not deny that his and Munk's dogs are blind, yet (p. 460) he claims that a dog who has lost his occipital lobes will still avoid very striking

obstacles, as, for example, strongly illuminated streaks on the floor.

The Brachial Centre.—Eskridge⁹⁸_{July} reports a case of abscess of the right forearm after typhoid fever, followed by left brachial monoplegia (slight involvement of face). Trephining was done by Strickler, of Colorado Springs, evacuating an abscess in the right motor zone, following which improvement was observed, but death occurred on the ninth day from "encephalitis." The abscess was found in the upper portion of the lower third of the precentral gyrus (cavity about twenty-five millimeters in diameter). Daraignez¹⁸⁸_{Oct. 29} exhibited a tumor as large as an English walnut in the middle part of the right pre- and post-central gyri. Symptoms during life were not fully observed, but attacks of brachial spasm and brachial paralysis on the left side, followed by left hemiplegia, led to a correct diagnosis *intra vitam*.

Heusner⁶⁹_{Oct. 18} reports two most interesting cases of injury to the motor zone, causing brachial paresis, with operation and recovery. In one case, a boy aged six years, a fall on right side of head produced an evident depression of the cranium five centimetres above the meatus, with temporary loss of consciousness and writing. Not till the seventh day did paresis appear in the left forearm and hand, accompanied by pain in the fingers. This was followed on the next day by pain in and paresis of the left leg. Operation resulted in removal of depressed fragment of bone and an immediate relief of the paralytic symptoms; recovery permanent. In the second case, a girl aged fifteen years received an injury of the right temporal region by a fall down-stairs, followed by momentary unconsciousness, without other symptoms of concussion. Immediately there occurred pain in whole of head, paresis of the left hand and forearm (fingers more paralyzed than is usual in cortical lesions), and very slight paresis of the facial muscles. As no improvement appeared, on the fourteenth day trephining was done. The bone was healthy, but the dura and brain bulged much. On opening the dura, the brain protruded, and presented a bluish-red appearance. An incision two centimetres in depth was made in the protruding convolution (the precentral?), allowing the escape of a dark-red fluid; the cut surfaces presented a punctated, bluish-gray appearance; no coarse coagula were found, and the brain subsided. The same evening the motor power fully reappeared in

the hand and the hyperæsthesia subsided. The facial paresis was not immediately benefited by the operation, but soon passed away, and, later, complete recovery was established. The seat of operation in the second case was seven centimetres above the meatus and five centimetres behind the coronal suture. By transfer to a prepared skull and brain the author shows that in both cases the lesion was in the middle third of the motor zone.

Cerebral Centre.—After a metaphysical argument against the existence of motor centres *as such*, claiming that these areas are only focusing points for centripetal impressions and reflex acts, Arndt⁴_{Feb. 20} relates the following case of paralysis of the legs following a cerebral injury. A soldier, aged twenty-two, received a wound on the cortex from a fragment of a shell. There was a depressed compound fracture, occupying a space as large as a small saucer, at the top of the head, vertically above the mastoid process, more over to the left side of the median. Arndt assumes that the upper part of the parietal lobes was injured. After a short period of coma, relieved by lifting of some of the fragments and by leeching (seven hundred to eight hundred grammes), gradual recovery ensued, leaving paralysis of both legs and a sacral bed sore. Further improvement followed, many fragments of bone were removed, and considerable improvement resulted, but the patient never fully regained the use of his legs. It is stated (but without necessary details) that the sensibility of the lower extremities was unimpaired; but as the observation was made in 1864, during an active campaign, some doubt may reasonably be entertained upon this point. At any rate, if there was no anaesthesia of the legs, the case overthrows Arndt's prefatory remarks on the mode of function of the so-called motor centres, and would support the strictly motor theory of their action. This case has already been published,¹²⁹⁵_{p. 89} and it is surprising that Arndt should not state the fact. M. Lunz⁶⁹_{May 19} reports a similar case, but so imperfectly that its true nature is uncertain. A male, aged forty-eight, received a severe blow from a horse's teeth (?) on the top of his head. He lost consciousness immediately, falling upon straw. Recovering consciousness in twenty or thirty seconds, he found that both his lower extremities were paralyzed. When examined three days later he presented no other paralysis; the face and arms were normal; the bladder and rectum acting.

There was no anæsthesia; patellar reflex increased. The wound was at the vertex, and measured three-quarters of an inch transversely; the bone was depressed. More exactly, the injury was over the sagittal suture, at a point intersected by a vertical line drawn from one ear to the other (consequently frontal of the Rolandic point). The absence of spasms led the author to adopt a fanciful theory of spinal concussion. A few days later slight atrophy of the muscles of the lower extremities was apparent, and electrical reactions were reduced (no details); catheter required for a few days. After the fourteenth day improvement began and progressed rapidly, and in a few days more the patient left the hospital on crutches. He was seen again in 1887, and then required the aid of one crutch; the bladder was normal; the legs seemed strong enough, but a distinct spastic state was present, with increased patellar reflexes. Nothing is said as to further progress of the wound. It appears to me that most probably both crural centres were injured by meningeal hæmorrhage, and recovery took place with slight descending degeneration. In connection with these two cases I would call attention to one of the most remarkable cases of injury to the crural centres, placed on record in 1858 by McLeod.<sup>1206
p.212</sup>

Jastrowitz<sup>68
Feb. 21</sup> contributes an excellent case (man, aged forty-three) of gradually increasing paræsthesia of the left extremities, right-sided headache, crural monoplegia on left side, followed by paresis of left arm and very slight paresis of face. Spasm, limited to the left leg, occurred ten days after distinct crural paralysis. Later still contracture and anæsthesia (muscular sense especially affected) showed themselves on the left side. Conjugate deviation of the eyes to right occurred before the first spasm. Near the close of life Hirschberg examined the fundus of the eyes and pronounced them normal. Death occurred without hyperpyrexia (38.9° C., 102° F.). The autopsy revealed a gliosarcoma four by five centimetres situated in the white substance of the right paracentral lobe. It was a subcortical tumor, yet localized headache preceded all other symptoms, but it was never severe. The same author reports a second case, of a man, aged fifty-seven, who, a little over a year after a fall in which the head was not directly injured, noticed a gradually increasing impairment in his handwriting, not unlike that observed in disseminated sclerosis. Next paresis of right arm

appeared, then of right leg, and about eight weeks after beginning of impairment of writing he had four convulsions in the right half of the body, starting in the leg. Later, contracture of right limbs occurred, with anaesthesia (the muscular sense being much affected). In the twelfth week motor aphasia occurred, and a few days later repeated localized spasms of the right extensor hallucis. There was no headache, and the optic nerves remained normal. It is interesting to note that the power of writing was completely lost before the arm was much paralyzed and before spasms occurred (agraphia). Death from pneumonia at about the sixteenth week. Autopsy showed a "haemorrhagic fibrous sarcoma," 4.5 by 2.5 centimetres, in the upper segment of the pre- and post-central gyri, surrounded by much haemorrhagic infarction of cerebral tissue frontal of tumor, and there were several young tumors separated by normal (?) tissue from the parent one. The tumors were strictly subcortical. The tumor and surrounding lesions were too complex to make the case one of value for finer localization. The principal tumor was apparently (no cut is given) at the confines of the centres of the leg and arm. In connection with these two cases I would call especial attention to the absence of choked disk, this being in support of a law first advanced by me in 1882, viz.: that choked disk or neuroretinitis is rare in cases of tumor of the cerebral hemispheres. Siemens⁴_{Apr. 9} reports a case of chronic insanity in which, in the last four days of life, Jacksonian symptoms appeared, viz.: convulsions beginning in the left foot and leg, spreading to rest of body, paresis of left leg. Death by previously acquired blood poisoning through a scratch in left leg. Autopsy showed a whitish hard tumor of dura, involving to a depth of four centimetres the right paracentral lobule, caudal end of first frontal gyrus, and gyrus fornicatus. It is claimed that no symptoms pointing to a localized cerebral lesion existed prior to time of first spasm four days before death, but any one knowing how the chronic insane are "observed" will not wonder much at the supposed latency of this tumor. Jastrowitz¹²⁰¹ in his Case VI gives a good example of lesion of the upper extremity of the right pre-central gyrus in a man aged forty-three. It was a gliosarcoma, four by five centimetres in size, encroaching upon the paracentral lobule. Symptoms during life: awkwardness of left hand and leg, paresis of leg, Jacksonian attacks beginning in left leg,

marked anæsthesia (first in leg) of all forms, especially of muscular sense; contractures, conjugate deviation of eyes to right, headache, no lesion of optic nerve (examined by Hirschberg a few days before death). A small nodule existed in the same hemisphere at the junction of the gyrus fornicatus and the precuneus, which probably produced no symptoms. The state of the inferior parietal lobule is not specially described, hence the case loses some of its value as relating to the question of muscular sense. Duration of illness fourteen months. Case VII of the same author is that of a man, aged fifty-seven, who, eight months after a severe fall in which the head was not directly injured, developed awkwardness of right hand, followed by right Jacksonian spasm, beginning and most marked in the leg; later right hemiplegia with contracture, marked loss of sensibility (including muscular sense), paresis of right sixth nerve, little headache, amnesic and motor aphasia; no hemianopsia or lesion of fundus. Autopsy showed a tumor (hæmorrhagic fibrosarcoma) 4.5 by 2.5 centimetres in the upper part of the left precentral gyrus extending back into the postcentral. Numerous secondary nodules existed in the neighborhood, especially above. It was a subpial growth, and contained many foci of hæmorrhage and thrombosed vessels; the lateral ventricle was perforated and contained a clot. The middle and lower parts of the precentral gyrus were the seat of hæmorrhagic infarction with softening. The adjacent frontal gyri were more or less softened (the third gyrus hardly at all). The rest of the brain normal. No secondary changes in pyramids. Duration of illness about five months.

In a case (*vide* Aphasia) of multiple tubercular nodules in the brain of a child, aged four years, one mass (as large as a big pea) was present on the upper (medial) end of the right precentral gyrus. During life paresis, localized convulsions, and hyperalgesia of the left lower extremity had been observed.

Ducamp³⁴⁸_{Aug.} relates the following case: Child, aged three years, suddenly developed epileptiform convulsions followed by paralysis of the right arm and leg; head turned to paralyzed side; no anæsthesia. Next day the leg was completely paralyzed and flaccid, the arm only partly paralyzed and contracted. In last twenty-four hours contracture of reversed distribution. Autopsy revealed a large (four by three centimetres) tubercular abscess

under the pia, destroying the cortex of the upper ends of the pre- and post-central gyri and the paracentral lobule.

The Visual Centre.—Schäfer and Brown have made new and more decisive experiments upon the cortical centre for audition in monkeys, which they presented to the Royal Society in December, 1887, and separately published in England ⁴⁷_{Jan} and America ⁵⁹_{Aug. 4} during 1888. The publication of their experiments in England drew forth a rejoinder by Ferrier, ⁴⁷_{Apr.} both communications furnishing valuable data, negative and positive. The questions at issue are whether the angular gyrus or the occipital lobe are more important for vision, and whether visual defects produced by a one-sided operation are bilateral in a diffused way or strictly hemianopsic.

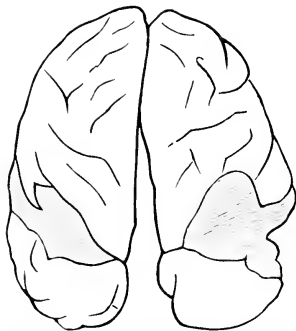


FIG. 1.—BRAIN OF MONKEY, WITH COMPLETE DESTRUCTION OF BOTH ANGULAR GYRI, VIEWED FROM ABOVE.
(*Medical Record.*)

Schäfer and Brown's operations appear, judging by the figure given, to have been most complete and precise in location, and to have been unaccompanied by inflammatory or necrotic changes in adjacent parts. 1. In a monkey both angular gyri were destroyed by the actual cautery as completely as possible from the surface. Result: no impairment of vision. 2. In another monkey, one angular gyrus was more completely destroyed by applying the cautery after separating the lips of the fissures. Result:

disturbance of vision, lasting only a few days, distinctly hemianopsic in character. In neither case were any motor or sensory symptoms observed in connection with the eyes. From these apparently faultless experiments, the authors conclude, in opposition to Ferrier, that the angular gyrus has nothing to do with vision or with the sensibility or motility of the eyeballs (Munk). In this connection the authors refer to a possible explanation of the temporary hemianopsia produced by lesion of one gyrus angularis by supposing a vascular disturbance of the visual centre, but they do not refer to the explanation offered by me ²¹²_{Jan} for human cases of hemianopsia caused by lesions involving the angular gyrus, viz.: the occurrence of lesion of the fasciculus opticus which passes close under the

gyrus angularis on its way from the internal capsule to the occipital gyri. 3. In a monkey, Schäfer and Brown excised the whole of one occipital lobe. Result: permanent lateral hemianopsia on the opposite side. In another monkey both occipital lobes were removed. Result: complete persistent blindness. In a third monkey the same operation was less perfectly performed, some of the basal cortex of the occipital lobe remaining. In this case the loss of sight was not complete, some vision remaining in the inferior halves of the retinae.

Schäfer's paper ⁴⁷_{Jan.} was followed by an acrid critical reply by Ferrier ⁴⁷_{May} and by a rejoinder by Schäfer. ⁴⁷_{July} The points at issue seem to be rather personal and relate to accuracy in the description of the lesions and in tests for vision and hearing. Ferrier holds to his views that the centre for audition is in the superior temporal gyrus, and that the gyrus angularis is more important for vision than the occipital cortex, though both serve for that function. Schäfer seems to have very much the best of the argument on both questions. The controversy is not pleasant reading, and, together with the extensive demolition of experimental localizations by clinical observations, go to show, as I have elsewhere maintained, that much more progress in cerebral physiology is to be expected from the clinico-pathological method than from the experimental. Were all experiments on the brain blotted out or lost to science, our knowledge of cerebral localizations would stand just where and as it is to-day.

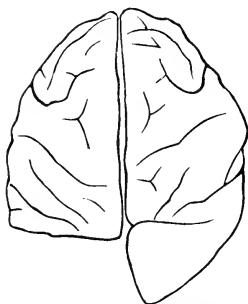


FIG. 2.—BRAIN OF MONKEY, WITH COMPLETE REMOVAL OF LEFT OCCIPITAL LOBE, VIEWED FROM ABOVE.

(Medical Record.)

Hemianopsia.—Badal ⁷⁰_{June, July} reports at length a remarkable case (unfortunately, not cleared up by autopsy) of inferior bilateral hemianopsia combined with ataxia, agraphia, and loss of many notions of locality and forms. The subject was a woman, aged thirty-one, who, after severe attacks of puerperal fever (with albuminuria) was delivered of twins, and suffered a large loss of blood. No hemiplegia followed, but several days of delirium, with impairment of vision, dilated pupils, and left ptosis. A pupil of

Badal's examined the eyes at this stage and found fundus normal. Later, when patient got about, she was remarkably blind in certain respects, more especially for ordinary occupations and for self-direction (all requiring vision below horizontal level of eyes). Examination by Badal showed greatly reduced visual fields (see cut), the two upper quadrants being free in the left eye, and only the right (temporal) upper quadrant in the right eye. Even these preserved parts of fields were remarkably limited at their periphery, leaving little useful retina besides the point of fixation (where vision was good). This accounted for many of the patient's peculiarities. Badal states positively that the fundus was normal, thus excluding retinitis albuminurica and embolism of central arteries. Iris reflex normal. The lesion causing this

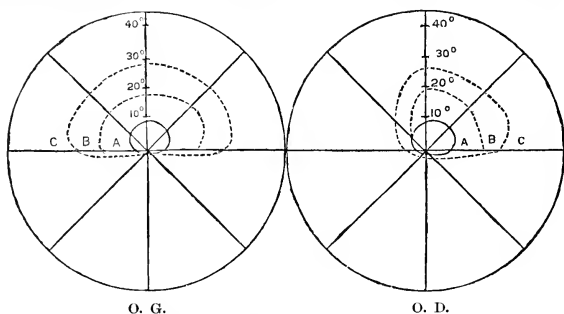


FIG. 3.

(*Gazette Hebdomadaire des Sciences Médicales de Bordeaux.*)

anopsia was evidently central, and probably cortical. It would be impossible to relate in detail the other symptoms presented by the patient, which are related at length by the author. He found ataxia well marked (except for figures) in the preserved parts of fields. Even drawings were not recognized. The loss of sense or memory of locality and direction was also pronounced, and the patient could not write at all. (It is a question whether this may not have been wholly due to loss of inferior vision, as there were not corresponding paresis and aphasia or paraphasia). The topographical recollection was so destroyed that the patient was embarrassed to distinguish right and left, up and down. Muscular sense (as tested by passive movements) was normal, but slight cutaneous anæsthesia existed over the whole body, more marked

in the pharynx. The special senses were normal. A case presenting the same remarkable loss of notions of space or topography, along with ataxia, etc., was abstracted from Batot in the ANNUAL for 1888, vol. i, p. 37.

Webber,⁹⁹_{Sept. 20} reports a case of much interest. The patient, a male, aged thirty-two years, had apparently suffered from severe migraine for several years, and had drunk much liquor. In the autumn and winter of 1882 he had repeated attacks of unconsciousness, with a different sort of headache. In November, 1881, numbness appeared in right foot, and later in right side, with awkwardness; later still well-marked right hemiparesis was observed. In March, 1882, right lateral hemianopsia was observed. At that time the right hemiparesis was well-marked. Shortly after there was a degree of paraphasia. When examined (April, 1882) there was right hemiparesis, partial right hemianæsthesia, and right lateral hemianopsia, with ankle clonus on right side. The ophthalmoscope showed a beginning of choked disk, though outlines of nerves were still distinct. Later still total blindness of the left eye was observed (by friends?); death occurred June 10th, about eight months after beginning of illness. Autopsy showed sarcomatous tumors in both thalami. That in the right tractus opticus was near the corpora quadrigemina, and the size of a "filbert-meat" (*sic!*); that in the left tractus opticus occupied the whole middle and posterior part of the organ, and was about the size of a small plum (*sic!*). The symptoms are quite well explained by the finding *post-mortem*. Siemerling³⁶⁸_{Bd. 19, H. 2} reports a case of multiple syphilitic cerebral lesions, mostly basilar, which is remarkable as affording a demonstration of the course and distribution of the fasciculus lateralis (or uncrossed fasciculus) of the tractus opticus. During life there was observed (among numerous symptoms) complete blindness of the left eye and temporal hemianopsia of the right. The autopsy showed (among numerous lesions) that the left tractus was completely destroyed by a tumor-like mass. The right tractus and chiasm were largely infiltrated by gummatous products, but the lateral bundle from the right corpus geniculatum to its distribution in the outer half of the optic nerve could be traced as a practically healthy bundle of nerve-fibres. A comparison of this finding with the state of the right visual field justifies the author in concluding that the fasciculus

lateralis supplies the whole of the lower outer quadrant and most of the upper outer quadrant of the retina. II. Oppenheim⁴_{July 16} contributes autopsies of two cases of gummatous infiltration of the anterior angle of the chiasm, causing during life bitemporal hemianopsia. He considers this form of hemianopsia as highly characteristic of syphilis. Rondot⁷⁰_{Nov. 17-21} reports three cases bearing on this question, but, unfortunately, almost worthless because of the absence of ophthalmoscopic examination. Case I. Female, aged eighty-four; obscure febrile affection, complete blindness of right eye, with temporary dilatation of the pupil; no limitation of left visual field. Death in a few days without paralytic symptoms. Autopsy showed a recent ulcerative endocarditis, softening of the internal aspect of the left occipital lobe (cuneus and precuneus). The visual tests must have been far from satisfactory, as it is stated that there was mental failure; from the cardiac lesion found it is highly probable that there was embolism of the central artery in the right eye. Case II. Female, aged ninety-nine; profuse hæmorrhage from vagina, followed next day by coma, with contracted pupils; return of consciousness, and ability to answer questions; complaint of vertigo and of loss of sight. Examination showed complete blindness of both eyes; motionless, pin-head pupils; absence of paralysis, anæsthesia, and deafness. Death on eighth day. Lesions: patches of reddish softening in both hemispheres; in the right on the frontal part of gyrus angularis, extending into inferior parietal lobule; in the left, two small foci, on the superior parietal lobule, just above the angular gyrus to the apex of the occipital lobe. There was also a small focus of softening (size of hazel-nut) on the internal aspect of the left thalamus, just under the ependyma. It is not stated how *deeply* the foci of softening in the angular region penetrated; the fasciculi optici may very well have been injured. But the absence of thorough ophthalmoscopic examination vitiates the case. Case III. Female, aged eighty-eight; left hemiplegia, without anæsthesia. Patient was blind in both eyes, but the examination of eyes did not extend beyond tests of pupils (good reflex) and media (slightly opaque). Autopsy showed softening of the external aspect of the left occipital lobe and of its central white substance; cuneus unaffected; right hemisphere normal. Rondot found the optic tracts and nerves normal, but he did not examine the eyeballs, where he probably would have found

changes. In conclusion, the author admits the existence of two centres or areas for vision in the human brain—one internal, consisting of the cuneus and part of the second temporal (?) gyrus; the other external, including the first and second occipital gyri, and in some brains the angular lobule. Lesion of one side (hemisphere) usually produces lateral hemianopsia, but it may also produce contro-lateral monocular blindness, or even binocular blindness. I allow so much space to this paper only because it is liable to be overvalued by the non-critical reader. Every observation in it is valueless, chiefly because intraocular lesions were not excluded; and yet the essay may be of service, if only to teach medical men that the use of the ophthalmoscope is indispensable to the study of cerebral diseases.

The Acoustic Centre.—

Schäfer and Brown ^{47 59}
_{Jan. ; Aug 4}

have repeated former extirpation experiments of the supposed acoustic centre, viz.: the superior temporal gyrus. They operated on six monkeys by means of the actual cautery. In one monkey both temporal lobes were wholly destroyed. Result: a degree of temporary imbecility with apparent feebleness of memory of all

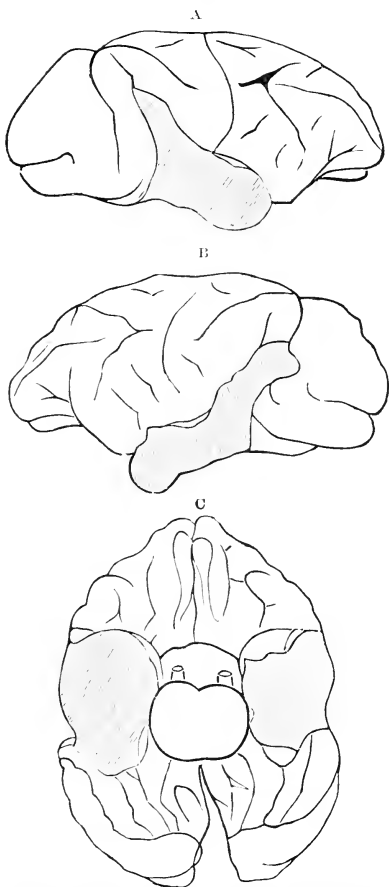


FIG. 4.—BRAIN OF MONKEY, WITH ALMOST COMPLETE REMOVAL OF BOTH TEMPORAL LOBES, AS SEEN FROM EACH SIDE AND BELOW.

(*Medical Record.*)

sense impressions. No deafness in any case. In the case of removal of both temporal lobes, smell and taste were present and unimpaired. Conclusion: the centres for audition, smell, and taste are not in the temporal lobe (in monkeys).

The Centre for Common Tactile Sensation.—Schäfer and Brown^{47, 50}_{Jan. 1 Aug. 4} have continued experiments already begun by Schäfer with Horsley for the purpose of determining the results of extirpation of the gyrus fornicatus. The astral cautery was used upon a monkey and quite an extent of the gyrus fornicatus destroyed. Result: permanent (seven months) hemianæsthesia of the opposite side of the body, pricking and touch being hardly, if at all, perceived. The report of testings is unsatisfactory, few details being given, and nothing being said of thermic impressions. It is stated that the forearm and hand were unaffected. It would be rash to base any statement upon such an experiment, but the authors express an opinion of "extreme probability" as to the sensory function of the gyrus fornicatus. Anatomy would seem to oppose this view. The gyrus fornicatus is far removed from the sensory fasciculi of the internal capsule, and, besides, in cases of congenital absence or atrophy of the corpus callosum the gyrus fornicatus is rudimentary or even absent.

This subject was brought to the attention of the American Neurological Association, at its meeting in September, by C. L. Dana, of New York,²¹²_{Oct.} in a carefully prepared analytical paper. From a review of one hundred and thirty-seven cases, Dana came to the conclusion that the sensory (for tactile sensation) and motor areas were co-extensive in man. Dana's conclusions are: (1) cutaneous anæsthesia of organic cortical origin is always limited to or is more pronounced in certain parts, *e.g.*, the face or arm, or two limbs of the body, and it is generally incomplete; (2) total hemianæsthesia is either of functional or subcortical origin; (3) cortical anæsthesia is always accompanied with some degree of paralysis. In the discussion A. M. Starr was disposed to support the induction of Dana, and also suggested that the tactile centres for each side of the body were distributed on both sides of the brain, so that in some cases a supplementary or compensatory function was established after lesion of one motor zone. I also favored the view that the motor cortex was to a certain extent endowed with sensory function, more especially for tactile impressions. This

view was supported by many facts, among others by the peculiar behavior of dogs in whom the motor zone had been excited on one side; they used the paretic limbs in such a way as to favor Schiff's theory of sensori-motor cortical function; also by the occurrence of a sensory aura or signal symptom at the onset of cases of true Jacksonian epilepsy. In the case of subcortical tumor treated by Weir and myself,⁵ July, Aug., Sept. where a part of the facio-brachial centre was entirely cut out, there was *persistent* partial anaesthesia (to tactile, caloric, and painful impressions) in the paretic face and upper extremity, greatest in cheek and hand, on the opposite side. C. K. Mills argued in favor of the view (supported by Ferrier) that the centre for tactile impressions is in the gyrus fornicatus and gyrus hippocampi.

Sensory Symptom in Cortical Lesions.—Apart from cases of Jacksonian epilepsy in which a sensory signal symptom is often noted, it is rare that distinct sensory symptoms are noted in cases of cortical disease or injury. Two cases of injury to the motor zone by Heusner⁶⁹ Oct. 13 are, therefore, of interest. In both cases after falls on the head and lesion of the middle third of the motor zone (bone pressure in one case, cortical capillary hæmorrhage in the other), paresis of the opposite hand and arm was accompanied by pain and by hyperæsthesia. Unfortunately, no examination of the state of tactile sensibility was made.

Negative Localization Cases.—Dercum¹¹⁹ Apr. places on record a case of cholesteatoma of the left frontal lobe, involving by pressure the first and second frontal gyri near the precentral gyrus on the right side. An exostosis and pachymeningitis overlying the tumor seemed to point to a traumatic genesis. No focal symptom observed; only choked disks, mental confusion, headache in the occipital region. Death from pressure symptoms. Bullen¹⁹⁶ Jan. reports a case of secondary multiple sarcomatous tumors (all small) of many gyri on both sides of the brain, in which no localizing symptoms were observed. It is necessary to note that the patient was insane, which materially detracts from the value of the observation. Van Merriis¹⁸¹ May relates the history of a young soldier, aged twenty-one years, who presented as only symptoms gradual failure of vision, double neuroretinitis, dullness, and slowness of all acts, increasing headache, coma. No localizing symptoms of any sort were observed; there was no aphasia or convulsion. At the

autopsy a gliosarcoma, the size of an orange, was found "occupying the position of the right temporal lobe. It was surrounded by softened and purulent (!) cerebral tissue, which had filled the right lateral ventricle. The cranium was remarkably thin, almost perforated, at a point in the right parietal region almost vertically above the tumor." I observed some years ago a case still more negative of tumor of the right temporal lobe. The only symptoms during life were a few general epileptic convulsions and much pain above the right ear. The last convulsion terminated life by coma. The autopsy showed a hemispheric (or hemiovoid) sarcoma springing from the dura mater and penetrating deeply, at least fifty millimetres, into the right temporal lobe. In this case examination a few hours before death showed perfectly normal eye-grounds.

SPINAL LOCALIZATION.

Anorexical Centre in Man.—Rosenthal¹¹³_{Apr. 29, May 6, 13} and Osler⁹_{Dec. 15} each publish a case in support of the view that this centre is situated in the *conus medullaris*, and that it innervates the rectum and bladder by fibres which go out with the third and fourth (perhaps also the second) sacral nerves. These cases are without autopsy, and are open to the interpretation that the symptoms were due to injury to the nerves themselves—neuritis in Rosenthal's case, contusion in Osler's. These cases agree with Ross' idea of the sensory spinal segments (*vide* p. 23). I object to the conclusion drawn from those and other cases, and from experiments in animals, because many facts exist to show that retention of urine may be a very early, or even the first, symptom of a lesion in the lower third of the dorsal region, and because of other facts, experimental and pathological, which indicate that a lesion in the *crura cerebri* may produce vesical paralysis. It seems *à priori* unreasonable to admit that such important functions as the action of the bladder and rectum should be under the government of a single centre in so poorly developed a region as the *conus medullaris*. Besides, the researches of Arthaud and Duprat¹²⁶_{Apr. 29, '97} show that irritation of the last lumbar and of the first sacral sympathetic ganglia cause vesical and natal contractions.

Sensory Localization.—A paper by Ross⁴⁷_{Jan.} on the "Segmental Distribution of Sensory Disorders" is most instructive, and will prove of interest and of value to the general practitioner as well as

to the neurologist. In the first part of the paper, Dr. Ross traces out the sensory areas of the limbs as supplied by certain series of displaced embryonic sensory series. In the upper extremity the outer extensor surface from the tip of the shoulder to the index-thumb region is supplied by filaments derived from the fifth, sixth, and seventh cervical nerves; the internal and posterior aspects of the arm, the inner side of the forearm, and the ulnar three-fourths of the hand are innervated by filaments derived from the eighth cervical and the first and second dorsal nerves. In the lower extremity the hypogastrium, inguinal, and the anterior and inner aspects of the thighs are supplied by fibres from the first to the fourth lumbar roots; the outer aspect of the leg and dorsum of the foot by fibres from the fifth lumbar and the first, second, and third sacral roots; the posterior aspect of the leg, thigh, and gluteal region by branches of the third and fourth sacral roots; the penis, scrotum (middle), perineum, and anus by fibres coming from the same nerves; and, lastly, the anus and coccygeal region supplied by the coccygeal nerves. In the second place, Ross advances a principle of anatomical connection of the splanchnic nerves supplying various viscera through the rami communicantes of the sympathetic with cells in the gray matter of the spinal cord, as he believes, with cells of Clarke's columns in the dorsal region and their homologues in the cervical and lumbar segments. In this theory he is supported by Gaskell and (previous to all others) by Poincaré. By means of this anatomical theorem he offers a plausible explanation of the associated, sympathetic, or somatic pains which accompany

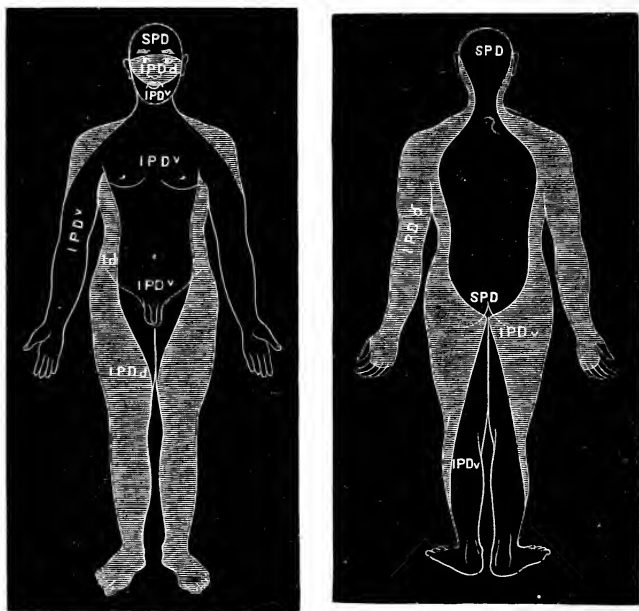


FIG. 5.

The lined portion on post-axial border of right arm of figure represents the area of anaesthesia caused by destructive lesion of the eighth cervical and first and second dorsal nerves, and the shaded portion in pre-axial border of left arm of figure represents the area of anaesthesia caused by destructive lesion of the fifth cervical root, as in Erb's paralysis. A back view would show a similar distribution to the front one.

(Brain.)

disease of various organs—the heart, lungs, liver, stomach, bowels, kidneys, ovaries, uterus, etc. The associated pains of cerebral disease are, he admits, impossible of explanation. As an example of the explanations given may be cited that of the somatic pains of cardiac disease. These pains are well known to be across the upper part of the chest, sometimes across the upper dorsal



FIGS. 6 AND 7.—DIAGRAM SHOWING CUTANEOUS DISTRIBUTION ON THE ANTERIOR AND POSTERIOR ASPECT OF THE BODY RESPECTIVELY.

SPD, distribution of superior primary divisions of nerves; IPDd, IPDv, distribution of the dorsal and ventral trunks of the inferior primary divisions respectively. The area of distribution of the dorsal trunks of the inferior primary divisions is alone lined.

(Brain.)

vertebrae, and frequently along the ulnar and musculo-cutaneous distribution in one or both arms. Now, several observers (Gaskell, Sturge, and others) have shown that the rami communicantes between the cardiac nerves and the spinal cord connect with the lowest cervical roots and the first two dorsal roots (mostly with the second dorsal root according to Gaskell). Hence an irritation of the filaments of cardiac nerves would excite that part

of the spinal cord which also receives the centripetal fibres from the inner (ulnar) aspects of the forearm and arm, the first and second intercostal nerves and their dorsal filaments.

APHASIA AND ALLIED STATES.

Amnesia.—This subject in its general relation is treated by Rouillard¹⁸_{Nov., Dec.} in an interesting essay, which needs not to be analyzed, but should be read by students of cerebral affections and psychologists. Arnozan¹⁸⁸_{v. 1, p. 229} reports an extremely interesting case in which retroactive amnesia followed a violent emotion in a man aged sixty-five. Sudden, though not unexpected, receipt of bad news caused an extremely violent emotion without external symptoms. A few hours later, when his sons came to sympathize with him, he received them without emotion, did not refer to the sad event, speaking of it as if he had never heard of it before, and not understanding why sympathy was extended to him. He also showed amnesia for many things which had occurred in the preceding three days. Further than this memory was normal, the patient was perfectly lucid, and had no disorder of speech. He was surprised at the anxiety of his family. When seen by Arnozan later on the same day the only physical signs present were some redness of the face and slight frontal headache. Memory was affected only in two ways: (1) complete amnesia of various (not all) things done in preceding three days; (2) total absence of recollection of all facts relative to the sad event, some of which dated back several months. Improvement began in twenty-four hours and memory was completely restored, except as to painful event and receipt of news in a few days. The report is made seven years later, and meanwhile the patient has been in good health and shown an excellent memory. The author refers to papers on the subject of "retrograde amnesia" by Azam (who originated the term and reported a traumatic case), by Pitres, and by Declas and Blanc-Fontenille, but does not give exact references.

R. S. Thomson²¹³_{Mar.} reports a case of progressive cortical disease in the left hemisphere characterized by motor aphasia, paraphasia (incoherent writing), intermittent attacks of right facial and cervical spasm, with paresis, developing later into right hemiplegia, hemiplegia, and hemianæsthesia (?). Toward the close of the illness word-deafness, and perhaps word-blindness, appeared. The

autopsy showed cortical degeneration of the left third frontal gyrus, the lower part of the pre- and post- central gyri, and of the first temporal gyrus. Within the hemisphere there was a cyst in the lenticular nucleus involving the frontal division of the internal capsule. The dura was adherent over the diseased gyri. Nothing is said of the state of the cerebral arteries, of the occipital gyri, or of the right hemisphere. The patient had previously suffered from severe attacks of periostitis, but denied syphilitic infection. Mercury was not given, and the doses of KI used are not mentioned.

L. Laquer, of Frankfort, ⁷⁵_{Jan. 15} reports a valuable case of sensory aphasia in a female, aged seventy-nine, who had had two slight apoplectic attacks. After the first no special symptoms were observed; after the second there was confusion of speech and what appeared to her relatives to be dementia. There was no paralysis. When examined by Laquer she presented typical paraphasia with word-deafness and word-blindness. For a few weeks there was also a singular inability to use or to comprehend the use of ordinary objects, tools, etc.; she would punch the floor with the wrong end of a broom; could not dress herself, use scissors, etc.; apraxia of Küssmaul. Hemianopsia was not carefully treated, and I suspect it may have existed on the right side, thus hindering the handling and recognition of objects. It is not specially stated that the muscular sense was normal. In a case reported by Ball, of New York, and myself ³⁵⁵_{v. 136} word-deafness co-existed with some apraxia dependent upon impairment of muscular sense, and there was found a lesion placed very nearly as was lesion No. 2 in the present case. The autopsy showed only two lesions, necrotic foci in the cortex and subcortical substance, both in the left brain. Lesion No. 1 involved four to five centimetres of the frontal end of the first temporal gyrus, and explained the word-deafness. Lesion No. 2 was at the junction of the left temporal, parietal, and occipital lobes. The Broca speech centre was normal, as was also the whole right hemisphere. The cerebral arteries were the seat of extensive atheroma, and the patches of softening were doubtless due to thrombosis or embolism. (See Fig. 27, diagrammatic).

Mosny ⁷_{Mar.} reports a case of a child, aged four years, inheriting a tubercular tendency from his mother, and who presented well-

marked motor aphasia among the symptoms (*vide* Crural Centre). At the autopsy several tubercular nodules were found in the brain, one in the base of the left third frontal gyrus.

Schütz^{309, 68} Bd. 13, July 15 reports three cases in which paraphasia and word-deafness were prominent features after apoplectic attacks. In all the cases foci of softening involved (besides other parts of the left hemisphere) the temporal lobe. In Case III, in which alexia was present, the lesion extended well into the occipital lobe. These cases are in support of Wernicke's localization of a centre for auditory word-memory in the dorsal or first temporal gyrus of left side.

Alexia.—J. W. Batterham⁴⁷ Jan. reports a most interesting case in



FIG. 8.
(*Neurologisches Centralblatt*.)

which this was almost the only symptom present. Patient, aged sixty, had a temporary attack of right hemiplegia three years before a congestive seizure which left her in her present condition, in which there is no distinct paralysis. No statement is made, unfortunately, as to state of visual fields or of cutaneous sensibility. There was no word-deafness: verbal amnesia was present only for some names. Spontaneous writing was preserved with only a few faults corresponding to the verbal amnesia. Object blindness could hardly be said to be present; though she often miscalled objects held up to her, she evidently knew them, and appreciated their use. Printed and written characters were, however, unintelligible

to her, except a few letters and words by help of certain devices. She had practically complete alexia. She could copy print or handwriting, but without knowing the meaning of the characters. Most remarkable, she could write letters clearly and logically but could not read what she had written. Numerals she could always recognize and name. No test was made of musical notes. She could correctly write from dictation. The recognition of objects (and of a few letters) was materially assisted by the use of other senses, including the muscular sense. The author concludes that the break in the speech mechanism was not in any commissural fibres, but in the centre for perception of written characters.

Bruns and Stoltz ⁷⁵_{Sept. 1, 15} place on record a very similar case. Male, aged fifty-one, sudden attack of right-sided hemianæsthesia (?) followed by a few days of delirium. There was probably also lateral hemianopsia at this time. On subsidence of delirium, in about four weeks after onset, careful observation revealed right lateral hemianopsia, slight object blindness, complete *alexia for printed letters and words, incomplete for figures and written characters*. No hemiplegia or hemianæsthesia, spontaneous and dictated writing normal, no word-deafness. The partial object blindness was corrected by the use of the tactile sense. After spontaneously writing something, the patient could not read it. There was also a slight degree of paraphasia. The authors make a theoretical localization of the lesion in the white substance of the left occipital lobe, so placed as to interrupt association fibres between the visual centres and the centre for vocal expression. The diagrams appended are far from satisfactory, as must be the case with such hypothetical diagnoses. The article contains, however, a valuable discussion of the subject of alexia based on the writings of Wernicke, Grassi, and Wilbrand.

Landolt contributes ¹⁰⁷⁵three interesting living cases of lateral hemianopsia associated with verbal blindness and other symptoms. In a fourth case there were left-sided paresis, right-sided lateral hemianopsia for colors only (hemiachromatopsia). An autopsy revealed an old hæmorrhagic cyst in the baso-medial part of the left occipital lobe. Rather curiously, the author concludes that the color centre lies in the deeper regions of the occipital lobe, probably in the caudal portion of the gyrus lingualis and gyrus fusiformis, but so gross a lesion as is described could not be utilized

for fine localization. Schlöss³⁶⁵_{v.s} relates a case of amnesic (?) aphasia remarkable for its pathology. A severe fall on the occiput was followed in a year by various symptoms of dementia, aphasia, right-sided paresis (including ptosis), and the autopsy revealed a periencephalitis with atrophy of the convolutions limited to the frontal segment of the brain (*i.e.*, extending as far caudad as the central fissure). The basal temporal gyri were small; the ventricles dilated and granular. The frontal lesion was evidently produced by *contrecoup*. Starr⁵⁹_{Oct 27} writes a remarkably lucid and interesting paper on apraxia and aphasia. Aphasia is well understood, but the term apraxia is new, and means the loss (or impairment) of the person to recognize the characteristics, uses, or imports of an object. In other words, the term covers varieties of amnesia, relating more especially to residua of forms, colors, direction, location, and uses of objects as perceived by the eye and stored away in the visual centres. It might also be applied to loss of residua of auditory, olfactory, gustatory, and tactile impressions. It may or may not coincide with word-blindness. The lesion in such cases (fifteen autopsies cited in the paper) is in the temporo-occipital region. Four cases illustrating the existence of apraxia with other conditions of the aphasic state are related (without autopsies). The following schema of a good study of any given case of aphasia is well worth reproducing, or should be used in connection with Bastian's schema of varieties of aphasia (*vide* ANNUAL of 1888, vol. i, p. 35).

To examine an aphasic thoroughly it is necessary to test:

1. The power to recall the spoken or written name of objects seen, heard, handled, tasted, or smelt.
2. The power to understand speech and musical tunes.
3. The power to understand printed or written words.
4. The power to speak voluntarily. Does he talk clearly? does he mispronounce words? does he misplace words? does he talk jargon?
5. The power to repeat a word after another.
6. The power to read aloud. Does he understand what he reads?
7. The power to write voluntarily. Can he read what he has written?
8. The power to write at dictation.
9. The power to copy.
10. The power to recognize the use of objects seen, heard, felt, tasted, or smelt.

The following cases illustrate some of the varieties of aphasia here described, and present interesting features:—

The Musical Sense in Aphasia.—Kast⁷⁵ reports a second case of perversion of the musical sense in a skillful amateur, in which with progressive improvement in the (motor) aphasia there remained a very imperfect musical expression, both with the violin and with voice. Musical hearing was perfect, and he detected his own errors as well as those of others. In his attempts to play, spontaneously or in imitation, he gives the correct time, but the melody is spoiled. 6. The opposite condition, viz.: that in which musical expression is perfect or nearly so, notwithstanding complete motor aphasia, has been long known. I believe I was the first to call attention to this. In 1874 I presented to my class at the College of Physicians and Surgeons, New York, a street-musician affected with motor aphasia to such an extent that he could only say "yes." This man whistled several airs quite correctly before the class. I have seen several similar cases since. Oppenheim³⁰⁹ v.13,p.345 has written upon the converse subject, viz.: the preservation of musical understanding and expression in aphasia even when complete. In some cases the words of the song are uttered by the patient as well as the melody. Persons who are word-deaf may understand the text as well as the air of a song. He observes that in certain cases of aphasia the musical faculty, exclamations, and recitations survive the loss of ordinary speech, music being the strongest or more deeply rooted. The explanation offered by Oppenheim is that musical sounds are far more elementary acquisitions than the sounds of language, and are more nearly related to emotions. He relates, among others, a remarkable case of an intelligent amateur who became aphasic, with word-blindness, partial word-deafness, agraphia, and paraphasia, who yet preserved his powers of musical perception, expression, and even note-writing.

Echolalia.—Case by Raymond.²¹¹ Apr.13 Woman, aged seventy-four; apoplectic attack, right hemiplegia; complete aphasia for a week, which nearly disappeared at the end of a month. Then involuntary and unconscious (!) repetition of any word or words said to her frequently occurred. Even such a word as "Demathyloxyquinidine" was at once correctly echoed. Autopsy showed a yellow patch size of an almond at base of left third frontal gyrus close to fissure of Sylvius, and a second in the first temporal within the fissure. From context it appears that a degree of word-deafness existed for a time.

Stammering.—Singleton¹⁸⁶_{May} recommends the following method of cure: The patient to be taught to speak slowly, to beat time of syllables with one hand, and (chiefly) to keep a small piece of pine-wood between incisor teeth while speaking. Mayberry¹⁸⁶_{Feb} advises only a regular, rigid, and systematic training in articulation begun at as early an age as possible. Speaking not to be attempted except when lungs are well filled. Waadt²¹⁴_{June 15} has treated three cases of stammering by hypnotic suggestion. In one the result was *nil*, another case (with defective speech in a stammering brother) was decidedly benefited; in a third case, without hereditary taint, a complete cure was obtained.

LESIONS OF THE CEREBELLUM.

Nonne⁶⁹_{May 3} reports a case of tumor of the frontal part of the upper vermis in a male, aged fifty-nine. Symptoms: moderate headache, weakness of the legs, loss of memory, slight vertigo, uncertain gait, with strong tendency to the right, double neuroretinitis, and increasing stupor. Besides, a tumor placed as above described, size of hazel-nut and tubercular (though the patient had had a chancre thirty-four years before). Absence of headache. Becker²⁰_{Oct. '88} reports a case of cerebellar lesion which is in conflict with Nothnagel's laws of diagnosis. The patient, a girl, aged eighteen, died of bronchopneumonia, after an illness of only a few weeks. For two years she had attended the polyclinic on account of anæmia and aural symptoms (not otitis), and the author had occasion to see her almost daily as a servant in a neighbor's house. Thus the complete absence of headache, vertigo, paralysis, and sensory disturbances previous to the fatal illness is quite well assured. Yet the autopsy revealed a cyst, size of walnut, occupying the middle of the vermis superior, and reaching deeply down toward the fourth ventricle. The cyst also penetrated the left hemisphere as far as the nucleus dentatus. Of the vermis, the monticulus, folium cacuminus, tuber valvulæ, and pyramis were destroyed, while the lingula, lobus centralis, uvula, and nodule remained. A summary of several recent cases by other authors is added. The cyst was probably the transformed residuum of a clot, but no history of an attack could be had. The escape of so much of the vermis will serve to justify our continued faith in Nothnagel's law of relation between vermis lesion and cerebellar titubation. Lunz⁶⁹_{May 10}

reports a case of gummata of cerebellum, five years after infection, Symptoms: headache, mostly frontal, attacks of vomiting, vertigo, characteristic drunken gait aggravated by closure of eyes, absence of paralysis and sensory symptoms, knee-jerk normal; ophthalmoscope not used. Autopsy showed two small tumors in close proximity to vermis inferior; these were on right side, and patient had a strong tendency to fall to the left. Specific treatment: KI (not given above four grammes [sixty grains] a day) had a temporary good effect; death very rapid from cerebral oedema. Bramwell,^{17 Jan} case of cancerous tumor size of small hen's egg in right lobe of cerebellum, strongly compressing the lateral peduncle. No paralytic symptoms; neuroretinitis; severe headache, positive vertigo, unsteady gait, transient delirium. The case is important because, though the gait was titubating, there was no lesion of the vermis. Rotation of the body, which is a symptom of compression of the lateral peduncle, was not observed. Hun^{216 May} places on record two cases of tumor of the cerebellum with autopsies. In one case the lesion, a passive cyst, was limited to one hemisphere, and staggering was not present, though vertigo was complained of. In the second the lesion was a solid tubercular(?) tumor of the hemisphere pressing upon the vermis; staggering gait was present, together with other characteristic symptoms.

Widal^{7 May} reports a unique case of hairy cyst of the cerebellum. It was of the volume of an orange and lay between the cerebellar hemispheres, completely compressing and effacing the middle lobe (vermis). The symptoms are not detailed and probably were not definite, as the patient was only seven years of age and had had "cerebral symptoms" for three years. A distinct connection between the hairy cyst and the scalp was demonstrated. The specimen is in the museum of the Trousseau Hospital in Paris.

Harriks,^{283 Aug. 15} youth, aged eighteen years, rather sudden appearance of failure of vision, headache, and giddiness, followed (?) by double optic neuritis; later, vomiting, provoked by turning in bed; attacks of convulsions of tetanic form (some without loss of consciousness) daily at the end; death in six weeks from first symptoms. The gait was not observed, as patient was confined to bed from an early period. Autopsy revealed a hæmorrhagic glioma attached to the lobulus centralis of the cerebellum, pressing toward the right side of the valve of Vieussens, on the right pro-

cessus and cerebrum, right nates and testes. Brush¹¹⁹_{Apr.} and Debierre,⁷_{Apr.} report each one case of crossed atrophy of the cerebellum, the smaller cerebellar hemisphere being on the opposite side of large parencephalic lesions.

In connection with the subject of treatment of tumors of the cerebellum, Zenner⁵³_{July 21} advocates, though without actual personal experience, tapping and drainage of the distended lateral cerebral ventricles for relief of certain symptoms. The same procedure has been more recently advocated by Keen⁹_{Dec. 1} for dilatation of the cerebral ventricles from any cause. While admitting the entire feasibility of the operation, I feel called upon to protest against its performance on the ground of inutility. Distention of the cerebral ventricles is usually due to one of two causes: (1) a mechanical obstacle to the outflow of fluid through the aqueduct of Sylvius (tumors of the cerebellum usually) and chronic inflammation of the ependyma of the ventricles themselves. The injurious effects of such overdistention, more especially those on the optic chiasm through the infundibulum, are probably always accomplished before a complete diagnosis can be made. The causes of distention above noted are incurable (except by removal of a cerebellar tumor), consequently the dropsy is certain to recur, and quite rapidly too. Hence two strong reasons for not performing the operation, its purely palliative and temporary utility, and the fact that it cannot correct organic mischief already accomplished.

J. Orne Green⁹⁹_{May 31} reports a case of suppurative otitis media, on right side, caused by a kick of a horse fifteen years before. In five months preceding admission to Massachusetts General Hospital had headache in vicinity of affected ear, chiefly in temple, daily vomiting, paresis of right facial nerve (which disappeared in a few days), tympanic cavity filled with polypoid growths, which were removed and revealed carious bone. Headache and vomiting returned in a few days (most marked when pulse was low—down to fifty-two at times); there was also vertigo on sitting up, slight delirium, coma, and death. Autopsy showed caries extending to posterior aspect of petrous bone, pachymeningitis, and an abscess the size of an English walnut in right half of the cerebellum; no fever was noted. The author adds the following remarkable comment: "The possibility of evacuating, draining, and healing an abscess of the cerebellum has not, I believe, yet been demon-

strated, although a number of successful operations on the cerebrum have been reported." The records of cerebral surgery do not warrant any such conclusion. Contrary to what the author states, the cerebellar hemisphere is very easy of access,—a view in which Stewart⁶_{Mar 25} coincides.

Baudouin⁷_{Mar.} reports cases of tubercular tumors of the cerebellum, involving chiefly the central lobe and the vermis superior; the lateral ventricles were distended. Symptoms: occipital headache, amblyopia (ophthalmoscope not used), temporary diplopia, exaggerated reflexes, stiff and titubating gait; only paresis was a slight one of left lower face. Strange to say, diagnosis was not made.

LESIONS OF CENTRAL GANGLIA, THALAMUS, NUCLEUS CAUDATUS AND NUCLEUS LENTICULARIS, PONS, MEDULLA OBLONGATA, ETC.

Nucleus Lenticularis.—Bramwell's case of cancer of the brain, referred to above under head of cerebellar lesions,⁴⁷_{Jan.} includes an additional negative case of destruction of one nucleus lenticularis. The left nucleus lenticularis was replaced by a cancerous nodule "the size of a shilling" (a wretched mode of description which scientific men should abjure; the author means a globular mass about 2.5 centimetres in diameter). Sollier⁷_{June} reports a case of common tabes which at a certain period was complicated by tremor of the left upper extremity of the type observed in paralysis agitans. No hemiparesis, volitional tremor, or ataxia of the arm. Autopsy revealed, besides the usual spinal lesions of post-spinal sclerosis, sarcoma of the right nucleus lenticularis impinging on the external capsule. It is expressly stated that the internal capsule was intact. The author refers to a similar case by Leyden.²⁰

Thalamus Opticus.—Senator⁷⁵_{Sept. 15} observed a solitary tubercle which had destroyed the greater part of the left thalamus, leaving only a part of its caudal and dorsal substance. The symptoms consisted of slight paresis of the right face, arm, and leg, with normal sensibility and reflexes. The most striking symptom was ataxia of the upper extremity. The mimic movements of the face were fully preserved, thus corroborating Bechterew's experimental results. Hogben³²_{Oct} relates a case of large cystic glioma of the left thalamus and adjacent parts (extending to hippocampi) of extremely rapid growth (apparently only seven weeks). Symptoms: headache, neuroretinitis, word-blindness and word-deafness, right-sided

convulsions. Sensibility not treated (!), and it is stated that hemianopsia "was not observed." It is a symptom which is not casually "observed," but must be sought for; it probably existed in this case. H. J. Thue³⁶⁹ (report of Dr. Eklund, corresponding editor, Copenhagen) reports a case of glioma of the left thalamus, which was found twice the normal size. Its caudal aspect was somewhat softened, of a purplish color. The tumor itself, about seven by four centimetres, extended into the caudal division of the internal capsule. The symptoms observed during life were: failure of vision with narrowing of visual field, especially the right, but no hemianopsia; paræsthesiæ and partial anæsthesia and paresis of right side of body. Epileptiform spasms more marked on left side, headache, at times slow pulse and delirium, stiffness of right limbs. Choked disk is not referred to. Perhaps the most important part of the case is the statement that while striking the right ligamentum patellæ produced no contraction of the right quadriceps, it caused a strong jerk of the left quadriceps; a crossed knee-jerk, which would upset many fanciful theories of knee-jerk. Allan McLane Hamilton³⁵⁵ has already reported a case of crossed knee-jerk.

Lesions of the Pons Varolii.—A remarkable specimen of lesion in the median line of the pons was presented to the Medical Union of Cologne by G. Sticker.⁶⁹ A woman, aged fifty-six, had eight years before suffered from purulent otitis media, and later from cerebral symptoms terminating in an erotic dementia, which latterly had shown itself only at intervals. In the three weeks preceding the severe cerebral lesions to be described, she had symptoms of central vagus irritation, viz.: attacks of palpitation, asthma, and syncope. Suddenly an apoplectic attack occurred which terminated fatally on the fifth day. During this the following symptoms were observed: paralysis of the right sixth and seventh (total) cranial nerves, anæsthesia of the right trigeminus; later, paresis of the left seventh nerve and paralysis of the left sixth nerve; variable paralysis of limbs on both sides (left arm and right leg most), deafness, mydriasis, followed by myosis, great irregularity of the heart, often twice as many systolic acts as pulse-waves, spasms in limbs; at the last, paralysis of both legs and of the right arm, coma. Autopsy showed a softened focus (due to thrombosis?) in the median line of the pons extending far down into the medulla

oblongata, extending from close behind the tubercula quadrigemina to a line drawn between the two recessi laterales of the fourth ventricle; it was more in the dorsal region of the pons and did not directly involve the pyramidal tract. Many details of this interesting case must be omitted. Bruns⁷⁵_{May 16} presented a specimen of glioma of the pons in a boy. The symptoms (following fourteen days after a slight cranial injury) were: paralysis of associated ocular movements to the right, paresis of those to the left; preservation of independent (convergent) action of interni. No lesion of optic disks. Crossed paralysis, i.e., paralysis of the right abducens (sixth nerve), facial, and acoustic nerves (normal ear), with left-sided paralysis of the tongue and extremities. Pulse very rapid, deglutition impaired, speech imperfect and syllabic; daily period of fever. The autopsy revealed a diffused glioma of the pons reaching almost to the ventricle, and (to the naked eye) leaving only the left pyramidal tract and the superficial pontic fibres uninjured.

Lesions of Medulla Oblongata.—Batterham⁴⁷_{Apr.} places on record a most interesting case of probable bulbar hæmorrhage. Patient, aged thirty-three, during a violent fit of asthmatic coughing, felt severe pain in head, down the left side of body, and was giddy. Left arm weak, speech indistinct; no loss of consciousness. When examined she presented: paresis of left arm and leg; slight loss of power in right arm; movements of lips impaired, especially on right side; deviation of tongue to left; great indistinctness of speech from lingual and labial defect; dilatation of left pupil; paresis of right side of velum palati; difficult deglutition; no anaesthesia or eye symptoms, except pupillary inequality. For several days there were frontal headache and sensations of falling (vertigo). No lesion of fundus oculi. Gradual but perfect recovery in two months. The author quotes Gintrac as reporting only two cases of bulbar out of seven hundred and fifty-one cases of intracranial hæmorrhage. Finlayson²¹³_{Apr.} reports a case of tubercular tumor of right half of bulb characterized chiefly by complete paralysis of the right sixth nerve with associated (miscalled conjugate) deviation of the left eye outward. There was total deafness on the right side, anaesthesia of the right cheek, paralysis of the right face; at the last, the right (!) hand was weaker than the left. Double optic neuritis was present, and the child was subject to

attacks of giddiness, headache, and vomiting. Another tumor under the frontal lobe explained the right-sided anosmia observed. The chief interest of the case lies in its demonstration of the value of associated deviation of the eyeballs with complete paralysis of one externus as a sign of injury to the nucleus of the sixth nerve. Under the title of "Congenital Bilateral Paralysis of the Abducens and Facial Nerves," Möbius³⁴_{Feb. 7, 14} reports a most interesting case, which in many respects is more interesting to the ophthalmologist. The patient, aged fifty years, presented complete paralysis of both external recti and of all the facial muscles (except a little voluntary power about the lips and chin). The affection dated from infancy, and the patient bore another malformation, viz.: webbed fingers on the right hand. The palatal muscles were unaffected. The facial muscles showed typical DeR. except the depressor anguli oris and levator menti. The face was, of course, completely expressionless and the eyes wide open. There was no strabismus (in other cases it is always reported) and convergence upon a near object was normally performed. In



FIG. 9.—COMPLETE PARALYSIS OF BOTH EXTERNAL RECTI AND OF ALL THE FACIAL MUSCLES.
(*Münchener Medicinische Wochenschrift.*)

attempted sideward vision, however, almost no movement of the associated internus could be obtained. The author cites a case of Chisolm's (Baltimore) exactly like his (except that convergent strabismus had existed until corrected by tenotomy) and one reported by A. Graefe somewhat complicated. The lesion in these cases is very probably unclear, affecting the nuclei of origin of the sixth and seventh pairs in the medulla oblongata, and an autopsy will be anxiously looked for, as it must, if done by an expert hand, throw light on several vexed points. I once saw a case of severe cerebral concussion which was followed by permanent paralysis of

both externi, with convergence. Unfortunately, I was not permitted to examine the case thoroughly. The lesion was most probably hæmorrhage in both nuclei of the sixth nerve. J. Schwalbe ⁶⁹_{Aug.30} relates a remarkable case of one-sided lesion of the pons-medulla transition, ushered in by an apoplectic attack and followed by crossed paralysis, as follows: Paresis and partial anæsthesia (with inco-ordination later) of the left arm and leg, diminished hearing on left side, paresis of the right lower facial muscles, nearly complete paralysis of the whole tongue, partial anæsthesia of the right face, paresis of the right vocal cord, slight difficulty of deglutition, speech was almost abolished. The ocular muscles were normal, and there was no choked disk, no aphasia. The patient had syphilis five years before, treated by thirty injections of corrosive sublimate; no secondary symptoms. The author makes an elaborate attempt at localization and pathological diagnosis, and concludes that probably there was syphilitic arterial disease with vascular obliteration, leading to formation of a patch of softening involving the right half of the pons and the centre of the medulla oblongata. The preservation of normal electrical reactions in the facial nerve excluded a lesion affecting its nucleus. The patient was discharged after eight weeks of treatment (not a word said of this!) greatly improved. Analogous cases (with more bilateral symptoms) are reported by Bruns. ⁷⁵_{May 15} F. Schultze ⁷⁵_{Aug.1} reports an interesting case (uncompleted by autopsy) which presented intentional or volitional nystagmus in all directions, loss of palatal reflexes, atrophy of one-half of the tongue, and spastic paresis of the limbs on the opposite side. There was probably a lesion in one (the left) half of the medulla oblongata.

Bulbar Paralysis.—Stern ⁴¹_{Nov.1} reports a case which during life presented symptoms of apoplectic bulbar paralysis. At the autopsy, to the naked eye the medulla seemed normal, and the gross lesion consisted in fresh hæmorrhages in both hemispheres. On microscopic examination of the bulb, however, an older clot two millimetres in size was found including the median line of the fourth ventricle and injuring both hypoglossal nuclei. The author considers the case to be one of continued pseudo and true bulbar paralysis.

Lesions of Tubercula Quadrigemina.—Nothnagel ⁶⁵⁰_{Nos. 6,8} ³¹⁹_{Aug.18} had the opportunity of thoroughly observing a case of tremor of these parts. A young man fell upon his head from a moderate height,

was unconscious for several hours, with vomiting. A febrile illness of several weeks' duration followed, with headache, vertigo, and constipation. Later, attacks of vertigo occurred. Six months after the accident walking was done with widely separated and everted feet. First seen in October, 1884, he suffered from paroxysms of headache and vertigo; the optic disks were swollen and pale; the peculiar walk was present. Soon there occurred epileptiform seizures, twelve in all; in some vertigo and immobility were the only symptoms. The patient increased in weight; he was lucid. In August, 1885, complete blindness, with motionless pupils and various nystagmus were noted. In 1887 anosmia was complete, but no other cranial nerve was involved. The walk is that of a drunken man; retropulsion is marked. Later a degree of spastic state appeared in the legs with increased knee-jerk and foot clonus, but without actual paralysis. No alteration of sensibility. In August, 1887, and frequently until death, cerebrospinal fluid escaped freely (sixty to one hundred cubic centimetres often collected) from the nose. When this was interrupted signs of cerebral compression occurred, viz.: stronger nystagmus, increase of reflexes, slower pulse, involuntary escape of urine and feces. Death by coma. Autopsy revealed a small glioma (size of hazelnut) partly on and in the corpora quadrigenina (lobi optici). The ventricles were enormously distended. The escape of fluid took place through the perineural space of the olfactory nerves, which were atrophied. No lesion was found in the cerebellum.

Chiasm Region.—A very instructive case of tumor of this region, assuming large proportions, is recorded by Mallins.⁶_{May 19} The symptoms were very numerous, but optic-nerve atrophy, with temporal hemianopsia of one eye, extreme tendency to sleep, feebleness without distinct hemiplegia, and an extremely chronic course (four years), with great variations in all symptoms except those related to vision, were characteristic features. The optic-nerve atrophy does not appear to have been preceded by choked disk. Battiscombe⁶_{May 19} relates a case of abscess of this part, apparently idiopathic, presenting following symptoms: Pain in different parts of the head, more persistent in the temples, nausea, intense photophobia, conjunctivitis, chemosis, exophthalmia, swelling of lids, no apparent impairment of vision (unfortunately, the ophthalmoscope was not used and the fields of vision not tested).

An irregular light temperature was present from day of admission (differential diagnosis from tumor). Duration of illness about four months; of acute period seven days; death by coma developed rather suddenly; no syphilis (!).

Facial Centre.—Benzúr⁵⁷_{Sept. 23} reports a case of tuberculosis in which left hemiparesis and Jacksonian epilepsy existed. The spasm began in the tongue, extended to the left side of the face, neck, arm, and leg in order, without loss of consciousness. Attacks could be aborted by the patient by putting a handkerchief in her mouth and compressing the left cheek. Headache was a prominent symptom. State of eyes not mentioned. The autopsy revealed (besides tubercles in the lungs, etc.) a tubercle as large as a hazel-nut in the right precentral gyrus at the junction of its middle and basal thirds. It occupied the region of square No. 71 of Exner's schema, but extended over to the postcentral gyrus.

Lesions of the Base of the Brain.—Springthorpe²⁸⁵_{Aug. 15} reports a case of hard tumor of the left middle fossa. It compressed the pons, involved the seventh and eighth nerves, the sixth nerve, and, later, the fifth nerve. The subject was a female, aged twenty-seven years, and probably syphilitic. The first symptoms were partial left hemiplegia, paralysis of the left face and deafness on left side, headache, paresis of left limbs, with choreiform movements of all limbs, more especially the right. At first there was no optic neuritis, but it was observed a month after admission to hospital or about six months after beginning of illness. Loss of vision and "neuroparalytic ophthalmia" of left eye set in a few weeks later, with severe pain in left side of head and giddiness. No anæsthesia except in range of left fifth nerve. Never vomiting. The case is paradoxical in that a tumor pressing on the left side of the pons produced paralysis on the same side of the body. Most unfortunately, the pyramidal decussation was not studied, as it should be in every such case.

DIAGNOSIS AND TREATMENT OF DISEASES OF THE BRAIN.

In two admirable lectures, Hughlings-Jackson²_{July 14, 21} exposes very briefly his well-known views on the scientific and practical study of nervous diseases. The lectures defy analysis, and should be *studied*, not read, by every practitioner. Nowhere will he find so strong a statement of the utility of scientific study of cases and

disease groups for practical purposes. When Jackson states that "no single nervous symptom is characteristic of syphilis;" that "no drugs can do anything whatever, good or bad, for cerebral softening;" that "many nervous diseases are due to non-nervous lesions in the nervous centres;" that "the routine use of the ophthalmoscope, the study of the arterial tension and of the urine are of extreme importance,"—we can only approve and urge attention to these *dicta*. The author is disposed to deny the (pathological) relationship between epilepsy and insanity—a statement which will doubtless provoke dissidence.

CEREBRAL DISEASES.

CEREBRAL ABSCESS (SUPPURATIVE ENCEPHALITIS).

Semeiology.—Sir William Stokes¹⁶_{Oct} contributes an elaborate paper on cerebral abscess which is of greatest interest in its surgical aspects (*vide* vol. iii, section B, p. 37). Medically interesting is the fact that cerebral abscess often shows symptoms a long time after the reception of the injury, from one month to several years. From other data in our possession it is likely that the abscess forms much sooner than its symptoms appear, or that slight symptoms are first manifested, followed by an intermission, after which the really typical symptoms present themselves. Rockwell¹_{Nov. 24} writes an excellent paper on traumatic cerebral abscess. As regards diagnosis, the author lays special stress on headache and tenderness on the affected side, suddenly developed convulsive seizures, followed by paralysis, rapid variations from normal to high temperatures. Optic neuritis is rare, as is also the subnormal temperature referred to by Nancrede and others. Strangely enough, the author does not mention slow pulse, which, with attacks of vomiting and increased headache, is certainly a very common symptom of intracranial abscess independent of location.

Pathology.—A case with poorly observed symptoms is reported by Ranking,²⁰⁶_{May} in which a large abscess at the base of the brain, with other smaller abscesses in the left hemisphere, sero-purulent exudation in left ventricle, and hæmorrhage in Broca's convolution, were found. No aural or traumatic or peripheral infectious causes, very probably idiopathic abscess (due to suppuration of gummatous products not found). Among symptoms a

constant high temperature of 104° to 104.6° F. (40° to 40.30° C.) was observed. Premature arterial degeneration in a young adult leading to cerebral hæmorrhage is described by Véron,^{243 Aug} a French army surgeon. The age of the soldier is, most unfortunately, not given, but probably it was not far from twenty-five years. His father had died of cerebral hæmorrhage at forty-five. The radials and many other arteries besides the cerebral presented stiffness and friability. The kidneys were small and granular; the left ventricle of the heart hypertrophied.

Netter and Delpuech^{7 Oct. 5} report a case of suppuration developed from a chronic otitis media suppuration of thirteen years' standing, in a boy aged sixteen years. The symptoms at first simulated typhoid fever, but excessive frontal headache, vomiting, chills, signs of jugular phlebitis (on same side as diseased ear, viz.: left), and, later, symptoms of pleuropneumonia, with an irregular fever ranging from 100.4° F. (38° C.) to 106.3° F. (41.40° C.) led to a correct diagnosis of suppurative meningitis, jugular phlebitis, and pulmonary infarction. No localizing cerebral symptoms occurred. Death on twelfth day after admission. Autopsy revealed caries of the left middle and internal ears, cerebellar abscess of continuity with diseased dura, phlebitis (with thrombus) of the lateral and petrosal sinuses of the internal jugular vein; multiple nodules in both lungs of a suppurative-gangrenous composition, a large semipurulent pleuritic effusion on the left side. The only trace of meningitis was a yellowish exudation in some of the sulci near the great longitudinal fissure. A most interesting point is that the mastoid cells were perfectly normal. In the various affusions, thrombi, and nodules bacteria of various (six) types. The streptococcus pyogenicus and the staphylococcus pyogenicus albus were clearly identified by cultures. Other forms resembled saphrogenic bacilli. Barker^{2 V. 3, p. 777} successfully operated on a case of abscess of the temporal lobe caused by rather latent suppurating otitis media.

Barrs^{2 Apr 7} briefly mentions a case of abscess in the white substance of the right hemisphere, due to infection from caseous and suppurating bronchial glands. The abscess contained very fetid pus, though no disease was found in the ears or petrous bones. I observed, during the War of the Rebellion, a cerebral abscess (of the nucleus caudatus) dependent upon suppuration of the

connective tissue of the forearm on the same side, in which extreme fœtor of the pons was present, so that the attempt to make any diagnostic use of fetidity of pus of cerebral abscesses appears useless.

Lesions of Chronic Hyperæmia.—Kusnezow⁷⁵_{Oct.15} has made a study, under Mierzezenski's supervision, of the histological lesions produced by artificial cerebral hyperæmia in dogs and rabbits placed on the rotating table of Mendal every day or three times a week for several months; rate of rotation from ninety to one hundred per minute for five or ten minutes. In all cases intense congestion of the upper spinal cord and brain, also of the diploë, was observed. There were also degenerative changes, even to complete destruction, in the cortical ganglion cells and many nerve-fibres. The vessels were distended with blood, and in the perivascular spaces serous exudation and exuded cells could be seen. The neuroglia elements were swollen. In animals subject to inverse rotation, *i.e.*, head in centre of the table, evidences of anæmia were seen, and, while some atrophic change was demonstrable in the ganglion cells and fibres, the pathological changes above described in the blood-vessels and neuroglia elements were entirely wanting. The author concludes that the centrifugally acting rotation produced an increase in the arterial pressure and also retardation of the venous circulation—a stasis with exudation of lymph and consequent malnutrition of the nervous elements.

CEREBRAL (MILIARY) ANEURISMS.

In a somewhat polemical article, Eppinger, of Gratz,²⁰_{Mar.} reiterates his opinion that rupture of the elastic coat of the affected artery is essential to the diagnosis of aneurism. He refuses this designation to the "Brouhard-Charcot military aneurism," which he considers as simple ectasis or dilatation of diseased walls. In this he opposes both Zenker and Löwenfeld (*vide* ANNUAL of 1888, vol. i, p. 44). He admits three forms of true aneurism: (1) congenital aneurism, (2) micotic-embolic aneurism, and (3) traumatic (simple) aneurism. From the stand-point of the histologist and pathologist, this critical classification is doubtless good, *i.e.*, has a scientific value, but for clinico-pathological purposes, for the explanation of cerebral hæmorrhage, etc., the term military aneurism must hold its ground for a long time.

Miliary Aneurisms of Lingual Vessels.—Gillot¹⁷_{May 26} calls attention to the ampullar or miliary dilatation of vessels under the tongue, more especially at one centimetre from its apex. He assumes, without any proof whatever, that there were "miliary aneurisms," and seeks to connect them with the arthritic diathesis and with the coincident development of miliary aneurisms in the brain. These dilatations are much more probably varicose in nature.

CEREBRAL HÆMORRHAGE.

Infantile Cerebral Hæmorrhage.—Murray⁶_{Sept. 1} reports a case of hæmorrhage into the substance of the left temporo-sphenoidal lobe in an infant nineteen months old. No cause was determined. Edwards¹⁸⁷_{July} relates the case of a lad, ten years old, who developed severe headache, vomiting, and purging in one night, then became comatose, and later delirious, convulsed, and paralyzed on the left side. Death in twenty-four hours. Clot found in brain, but location not well described (in frontal lobe). No etiology determined.

MENINGEAL HÆMORRHAGE.

Ewen²_{Apr. 28} reports a case of traumatic subdural hæmorrhage, which is interesting on account of the slow development of symptoms. Boy, aged ten years, received a blow on side of head, and not till sixty hours had elapsed did the subject complain of severe headache and pass into coma with general relaxation. When seen, on the third day, the pupils were widely dilated and quite inactive, there was vomiting, subnormal temperature, total unconsciousness, and general relaxation; death at noon, *i.e.*, seventy-two hours after injury. Autopsy showed a large, thick clot only on the left side, between the dura and bone; the temporal bone was unusually thin, and thus the meningeal artery was peculiarly exposed. Unfortunately, the physician did not know of the injury at the time of examination.

EMBOLISM OF CEREBRAL BLOOD-VESSELS.

Prognosis.—J. S. Bristowe⁴⁷_{Apr.} contributes two cases to show that recovery from embolism of a large artery may be both rapid and complete. They are good cases, and only open to the logical objection which must hold against all cured cases, *viz.*: absence of anatomical demonstration. In one, a female, aged twenty-five, with

well-marked valvular disease of the heart, an attack of right hemiplegia with aphasia occurred without loss of consciousness, but had passed off entirely when seen by Bristowe a fortnight later. Subsequently second attack occurred, which was followed by the usual residua. In the second case (*vide* Diseases of the Spinal Cord) temporary paraplegia was produced by plugging of the abdominal aorta.

THROMBOSIS OF CEREBRAL BLOOD-VESSELS.

Farrari, of Genoa, ⁸⁴_{June 16} reports experiments on dogs consisting in obliteration of cerebral sinus by wax injections. Blockade of all the sinuses produced death in a few minutes, with epileptiform manifestations. Obliteration of the sinus of the calvarium produced no symptoms, and if twenty days later some basal sinus were filled no symptoms occurred (not even choked disk) until the ophthalmic veins were included, when death occurred rapidly without having histological changes. The author concludes that the return circulation from the encephalon is amply provided for, safety-valve exits existing through the ophthalmic veins and the vertebral veins.

THE CEREBRAL PALSIES OF CHILDREN.

W. Osler ⁹_{July 14 to Aug. 11} in five lectures treats of this interesting topic in a masterly manner. These lectures not only present the subject fully in its present aspect, but will serve as a *point de départ* for more elaborate studies of the numerous unsettled points involved. Besides utilizing the material already accumulated in preceding monographs and articles, the author analyzes one hundred and twenty-seven hitherto unpublished cases in the practice of the Philadelphia Infirmary for Nervous Diseases and twenty-three cases from the Elwyn Institution for Feeble-minded Children, placed at his disposal by Drs. Kerlin and Wilmarth. Osler divides his material under three clinical heads, viz.: (1) hemiplegia, one hundred and twenty cases; (2) bilateral hemiplegia, nineteen cases; (3) paraplegia, eleven cases;—making a thorough analytical study of semeiology and etiology of these three conditions. Among symptoms which may be considered as ultimate results of the cerebral lesions, disorders of movements, epilepsy (common and Jacksonian), and imbecility are well studied. The remarkable

absence of bladder symptoms, of anaesthesia, and of aphasia is well observed, though perhaps sufficient stress is not laid upon the remarkable education of the right cortical centres for speech which ensues in aphasic or right hemiplegic children. Under the head of pathological anatomy it is stated that in nine cases *haemorrhage*, meningeal usually, was found; in seven cases only *embolism* (though on clinical grounds the author believes this to be a much more important factor); in fifty cases the brain presented diffused or nodular sclerosis, and in twenty-four cases more or less *porencephaly* was present. The causal relation of difficult labor to meningeal haemorrhage is noticed, as also the alternative condition that in some cases the initial convulsion (which is frequently seen to usher in the cerebral palsy of children) may be either the cause or the result of meningeal haemorrhage. As primary cerebral lesions leading to what later appears as "sclerosis," the author mentions (1) post-febrile embolism, (2) lesions of arterial coats, (3) various thromboses, (4) encephalitis. He does not apparently attach much importance to Strümpell's ideas that "polioencephalitis" (as an equivalent of poliomyelitis) is a frequent factor. The prognosis as regards life is not bad, as the average age attained by children so affected is above twenty years, but recovery of motor power and skill is very rare. Treatment is almost limited to that of the residua, and is embraced under these heads: First, orthopaedic and electrical treatment for the paresis and deformities; second, anti-epileptic medication; third, education of speech, of special senses and mental functions generally, as practiced in well-organized schools for backward children.

PORENCEPHALY.

Audry ⁹²_{June, July} writes a very exhaustive critical digest of cases of porencephalia, adding some interesting new cases observed in the Hospital of Lyons. He restricts the term to such specimens as show destruction of cortical or white substance, or both, excluding such cavities as are filled with blood, pus, tumors, or parasitic formation, and pseudoencephalic or anencephalic monstrosities. He gives a *résumé* of one hundred and three cases from the time of Reil (1812) to the present, the collection being apparently complete as relates to German, English, French, and Italian literature. A few points of interest are worth citing. Out of ninety-six

observations in which a good description of the lesion was given, thirty-two presented lesions in both hemispheres, being often quite symmetrical. In eighteen cases almost the whole of both hemispheres had disappeared, and the ventricular floor was exposed; the immense majority of cases contradicted Kundrat's idea that the loss of substance affects definite vascular territories; the cavities may open into the intermeningeal space, but usually they are walled in by a membrane which may be extremely vascular; the cavities are generally filled by a fluid which may be so abundant as to be equivalent to a hydrocephalus; it may be clear as water, or of various light shades from yellow to brown; in a few cases the walls of the cavity are apposed, and no fluid exists. The gyri about the cavity may present a normal appearance, with more or less cicatricial change, or may assume a radiate arrangement from the hole. Very seldom is there positive evidence of change in the artery supplying the affected part of the brain. The differential diagnosis is elaborately treated of, successfully as relates to post-mortem recognition, but very vaguely as to clinical diagnosis. In relation to the semeiology of the affection, the author discusses the question whether a strictly speaking congenital cerebral paralysis can occur, in view of the fact that the pyramidal tracts are undeveloped at birth, and decides it affirmatively. As regards pathogeny, he considers porencephaly as the result of one of a number of common lesions, hydrocephalus, encephalitis, hæmorrhage, embolism and thrombosis, traumatism, and arrest of foetal development. As regards etiology, thirty-four out of fifty-eight cases appeared to be of foetal origin; in thirteen it was developed within the first two years of life; in a few cases during second infancy; only one case in adult life. More women than men were affected—forty-seven and thirty. Natal and obstetrical causes seemed very important, as also marasmus (athrepsia) in newborn and very young infants. The symptoms are exceedingly various, but paralysis, contractures (after bilateral spastic state), convulsions, cranial deformity, idiocy (thirty out of fifty-seven cases) are the principal. In as many as thirty-five cases (out of fifty-seven) the mental faculties were fairly good. Sensibility is always (?) preserved. Aphasia is rare, except in congenital cases with large cavities.

Prognosis.—In thirty-three cases the patients lived to adult

age; thirty-two died in the second period of infancy, or in adolescence; fourteen died before the end of the second year; there were sixteen cases in which life existed only for less than one month. Phthisis was noted in twelve cases. Debierre⁷_{Apr.} reports the case of a woman, aged sixty-four, with extensive destruction of all the outer aspects of the right hemisphere, including the whole of the third frontal gyrus, parietal lobe, angular gyrus, temporal lobe, all the Rolandic region except its upper part. The internal (mesal) and the occipital gyri were preserved. The cavity was limited by remains of the pia, the ventricle wholly visible, central gray bodies much atrophied, pyramidal tract atrophied below. The opposite (left) lobe of cerebellum was smaller than the right. Vessels very atheromatous. The symptoms dated back only to the forty-ninth year, when an attack of "cerebral hæmorrhage" occurred, followed by left hemiplegia and contracture and by other less severe attacks. Death in 1888 by moist gangrene of right foot. In spite of the clinical evidence, both the author and Bressaud were disposed to look upon the lesion as congenital (evidently an impossibility, owing to absence of hemiplegia, contractures, etc., prior to 1871). Brush¹¹⁹_{Apr.} reports a case of "paresis" from the Pennsylvania Hospital for the Insane, in one of which from childhood there had existed symptoms of a lesion in the right brain. Owing to the patient's mentally disturbed condition, the state of sensibility and condition of vision could not be tested. Autopsy revealed several foci of porencephalia, a large cavity occupying region of right inferior parietal lobe and angular gyrus, part of right postcentral gyrus, the lobus quadratus, and cuneus. The left cerebellar hemisphere was atrophied, but, curiously, the author speaks of increased growth of the right lobe, "owing to absence of resistance from the right cerebral lobes."

SATURNINE CEREBRAL LESIONS.

Distribution of Lead in the Brain.—A. N. Blyth¹⁶⁶_{Jan.} has analyzed the brain and some other organs of two lead-factory operatives who died rather suddenly, without paralysis. In one case he found in four hundred and one grammes of brain 34.34 milligrammes of lead sulphate, and that, assuming that the patient's encephalon weighed twelve hundred and thirty-five grammes, it must have contained during life at least 105.77 milligrammes of lead sulphate

(nearly two grains). In the second case more prolonged alcoholic maceration was made, and the cerebellum analyzed separately from portions of the brain. Supposing that the entire brain weighed one thousand and ninety-seven grammes, the amount of lead sulphate would have been 99.7 milligrammes. In the cerebellum, pons, and medulla, 17.4 milligrammes were found, making a possible total of 117.1 milligrammes (nearly two grains) in the whole encephalon. The cerebellum contained relatively more lead than the hemispheres ("brain"), 107.92. The author considers it highly probable that 74 per cent. of the lead in the brain was in chemical combination with one or several of the complicated nitrogenized and phosphorized brain-fats. Mr. Blyth's views on the nature of lead poisoning are metaphorically represented by likening plumbism to some very refined method of vivisection, by which an operator is able to destroy not nerve-centres, but thousands of the ultimate parts of nerve-centres. Such a view is merely regarding the so-called "elective" influence of lead from another and slightly different aspect. Lead was also found in several other organs examined.

Westphal³⁸⁸_{Bd. 19, II, 3} has made an elaborate study of thirteen cases of saturnine encephalopathy, with two autopsies. He found general and focal symptoms in various cases. Psychological disturbances belong to the first group, consisting in depression, a peculiar combination of melancholia and dementia, hypochondriacal notions, with feebleness of memory and emotional excitability. Nearly all the patients complained of headache and vertigo. Convulsive attacks, general or localized, were common; in five cases they presented a strictly epileptic character. Delirium was rare. As focal symptoms Westphal observed hemianæsthesia, loss of smell; impairment of vision in six cases, consisting in amblyopia, concentric limitations of fields, in reduction of color perception, and in typical hemianopsia. Various cranial nerve-nuclei were affected in other cases. In two cases there was typical hemianæsthesia; in one case aphasia. Westphal concludes that lead acts (1) directly on the brain or nerve-tissues; (2) on the central blood-vessels, and thereby indirectly causes other cerebral lesions; (3) on the kidneys, causing symptoms of uræmic intoxication; (4) there may be a combination of those lesions. Wickham¹⁷_{June 28} reports an interesting case of pseudo-general paralysis, with albuminuria, due to chronic

lead poisoning. The symptoms were so pronounced that Charcot diagnosticated general paralysis. Under treatment a cure (?) was obtained in four months. Sulphur baths, iodide of potassium, and bromide of sodium seem to have been the efficient remedies. Bramwell⁴⁷_{Jan} reports a case in which colic, severe headache, impaired vision, fine tremors, and general malnutrition, together with a partial blue line in gums, indicated chronic lead poisoning in a man whose occupation for three years had been grinding and mixing litharge. One analysis of the urine failed to reveal any lead. The point of interest in the case is that there was extreme contraction of the visual fields, with still greater reduction of fields for colors (yellow and blue, most) in eyes with normal optic nerves. The ophthalmologist (Dr. Berry) who confirmed the perimetric findings expressed the opinion that the condition resembled hysterical amblyopia. What doubt might exist as to the correctness of the diagnosis of plumbism is removed by the complete recovery (in less than two months) under the use of sulphate of magnesia and KI. Lindt²¹⁴_{May 1} relates a fatal case of plumbism in a woman employed only half a year in a type-foundry. It was found that, in spite of warning, she had eaten with unwashed hands. She had no paralysis, but anæmia, icterus, constipation, attacks of colic, and headache were followed by convulsions and coma. The fundus oculi was normal, and the urine showed no signs of renal disease. A blue line existed on the gums. After repeated convulsions (no active treatment) death occurred on fourth day. Autopsy negative (as in the four fatal cases of Corner, two of which formed the subject of Blyth's analysis). The microscopical examination is to be made by Professor Langhaus. The director of the foundry reported that the case was the only one which had occurred in the establishment. The following instances of unusual sources of lead poisoning⁴⁰⁷_{Jan.-Mar} are of practical value:—

In 1887 upward of a hundred persons near Roanne, in France, were attacked with colic of great severity; some suffered from lassitude and general pains, others from vomiting. It was later discovered that some had well-marked blue lines on their gums, and the water supply was examined, but as it was derived from several sources it was eliminated from suspicion. Other articles of food were examined, and especially the flour, when it was ascertained that about sixty people, who were seriously ill, had partaken

of flour from a particular mill. A sample of this rye-flour was analyzed, and lead was ascertained to be present in it, though to what extent could not be estimated. It was then discovered that the grain at the mill was transported to the millstones by means of an elevator of buckets which was found to consist of tin-plate containing a good deal of lead. The rye-flour which passed through these buckets contained not less than five ounces of the metal which had been rubbed off into the grain, and those persons who had eaten rye-bread exclusively suffered most severely, while those who used wheaten flour, obtained from another elevator, were not attacked at all. In certain parts, also, a deposit of sulphide of lead was found, owing, probably, to the cracks in the grindstones having been filled with sulphur, and which had been brought in contact with the buckets.

Another case of lead poisoning was brought before the Paris Société de Chirurgie by Duguet.⁴¹⁹_{Mar. '87} A woman, thirty-eight years old, was employed in a factory to gum small bands of paper on to colored cardboard boxes. In order to pick up the bands she was obliged each time to wet her fingers with her tongue and afterward to wet one side of the band that was colored gray, the other side being colored orange, so as to gum the band on to the box. She frequently gummed as many as five thousand in one day; she stated that her companions, when doing the same work, became pale and thin and suffered from colic, while those who gummed the blue bands did not suffer at all. The bands of paper were analyzed, and each was found to contain one-fifth of a grain of lead in its metallic state.

Interesting cases of "hysterical" paralysis in patients suffering from plumbism are reported by two authors: Dutil,⁵⁵_{Feb. 18} case of a plumber who developed left hemiparesis (face normal) with complete left hemianæsthesia. There was concentric limitation of the visual fields, more marked in left eye. Great improvement under mild galvanization (how applied?) after failure of metallo-therapy (iron not tried). Nonne,⁶⁹_{June 21} case of a worker in lead who eight years before suffered from colic, followed in two and a half years by paresis of right upper extremity which rapidly disappeared. Half a year before report he had renewed paresis of right arm, hemianæsthesia (including special senses; right visual field concentrically limited, and blind for red), paresis of right leg. Very fanciful diagnosis of lesion of internal capsule made by Eisenlohr.

Ordinary treatment of no avail. Under hypnotic suggestion paresis diminished and disappeared, and at time of discharge the only symptoms remaining were some weakness of grasp of hand and a partial anaesthesia (of "cuff-like" shape) over lower third of forearm. It is greatly to be regretted that the electrical reactions were not noted. Möbius ³⁴_{Feb. 7} calls attention to lead poisoning occurring in workmen employed in the perfection of furs, preparations of lead being used to dye the hair.

PSEUDO-GENERAL PARALYSIS.

Rouillard ¹⁰⁰_{July 7} describes under this head a number of affections which simulate general paralysis (or "paresis"). The paper is very suggestive, though it is marred by the Chauvinism which distinguishes too many French articles, only two or three German and no English authorities being quoted. The following varieties are admitted: alcoholic, saturnine, pellagrous (?), syphilitic. The question is further complicated by asking whether we may not have a pseudo-dementia paralysis (without delirium) and a pseudo-general paresis (with prominent mental symptoms). The sketch of the alcoholic form is well done, but this cannot be said of the others, the syphilitic especially being quite insufficiently portrayed (far less clearly than by English authors, Mickle and others). As regards alcoholic pseudo-general paresis, the author calls attention to the following very important points for diagnosis: Hereditary influence in general paralysis is only such as relates to organic cerebral diseases, while in the pseudo form there is often inheritance of alcoholic desire and of ordinary insanity. The onset is much more sudden and the tremors much coarser in the pseudo form; in it intermissions or even real cures occur, and patients may experience many (from two to sixteen) distinct attacks. In the pseudo form digestive symptoms are present, while true "paretics" usually have excellent appetite and digestion. Sensory symptoms, hyperaesthesia, and anaesthesia are common in the pseudo form. An ugly temper with suspicions is characteristic of the alcoholic form, whereas paretics are generous and kindly. The lesions found in the pseudo form are more in patches, pachymeningitis is more common, and so are generalized arterial changes. The article is well worth reading, if only to serve as a basis for further investigation.

GRANULAR EPENDYMITIS.

Baroneini⁶⁸⁶_{V. 25, p. 237; Oct. 15}⁷⁵ has made a special study of granular formations in the cerebral ventricles. They were found thirty-two times in six hundred and fifty-two autopsies; twenty-seven times in cases of "paresis." Although much more common in "paresis" than in any other disease, yet they were absent in twenty-seven out of sixty-two paretics. In other words, 85 per cent. of all cases occurred in paretics, yet only 43 per cent. of paretic brains showed the lesion. In only two cases were the granulations limited to the fourth ventricle; in all other cases they were found in all the ventricles. There seemed to be a direct relation between this lesion and inflammatory changes in the meninges.

HYDROCEPHALUS.

Semeiology and Diagnosis.—Penzoldt³⁴_{Aug. 21} reports case of an adult female, who for four months complained of headache in various parts, dizziness, vomiting, globus; at the last stiffness of the neck; no paralytic or sensory symptoms pointing to cerebral lesions; remarkable intermissions, the general aspect of the case was that of hysteria. Autopsy revealed slight leptomeningitis of the convexity, extreme distention of the ventricles (also of fourth ventricle), with granular ependyma. State of fundus oculi not mentioned. Eight years before there had been a severe fall on the head, followed by two days of unconsciousness.

Escape of cerebrospinal fluid through the nostrils has been twice observed. In one case by Nothnagel (*vide* full report under head of Lesions of Tubercula Quadrigemina); in the second, by Groh,⁶⁵⁰_{No. 9} the patient (a youth) was supposed to have hydrocephalus. When he lay upon his right side, or held his head strongly inclined to the right, a thin serous fluid trickled from the right nostril.

Treatment.—Sourma⁴¹_{June 29} recommends the following treatment for hydrocephalus congenitus and other chronic forms in young children. The child's occiput is to be exposed to the direct heat of the sun every day for a month, on the first days for fifteen or thirty minutes, afterward for forty or fifty. Increased action of the sweat-glands of the scalp is alleged to be the *modus agendi* of this treatment. Mosler⁶⁴⁸_{No. 62} relates an unsuccessful attempt of treatment of hydrocephalus in a child one and three-quarter years old. The fluid re-accumulated after each puncture, as the author

might have expected if he had been better conversant with literature. The article begins with a flourish about the utility of the treatment of meningeal affections by counter-irritants (blisters and unguentum antimonii especially) in which he does not refer to the best attempts in this direction by Mendel (in the treatment of general paresis). Besides the general inutility of the experiment, Mosler's procedure was bad in that he punctured the anterior fontanelle in the middle line, thus running the risk of wounding the longitudinal sinus. The objections to aspiration apply with equal force to the plan recently proposed (by Keen), aspiration or drainage in the hydrocephalus of adults; the fluid is sure to be reproduced. In a discussion in the Medical Society of Berlin, Henoch⁴_{Nov. 19} stated that he had practiced aspiration in five cases repeatedly (in one case six times) without either good or bad result. In two of the cases, injections of iodine were made after removal of fluid. He, consequently, did not favor treatment by aspiration.

SEPTOMENINGITIS.

Sceniology and Diagnosis.—Hosmer⁹⁹_{May 17} presented autopsy of a case, which ran a remarkably acute course, lasting only six hours. First symptom was a slight convulsion, laryngeal obstruction simulating croup, high temperature, 106.5° F. to 107.6° F. (41.44° C to 42° C.), absence of vomiting. There had been no prodromata. Autopsy showed a dry, glazed brain, with adhesion between the gyri and between the hemispheres; the vessels of the pia were injected. No pus or tubercles. Other organs normal. (In the absence of a microscopic examination some doubt must rest upon this case.) Freyham¹⁰¹_{Aug. 2} reports three cases of meningitis complicating typhoid fever. In two cases the symptoms appeared during the second period of the disease, and in one during convalescence. The symptoms were headache, photophobia, pain, and tenderness of cervical region, with some stiffness or episthotonus, vomiting, slight hemiplegia, increased reflexes (foot clonus in two cases), and general hyperæsthesia. Optic nerves not observed. All recovered.

Karth¹¹⁸_{Aug.} reports case of nursing child, aged nine months, with restlessness, insomnia, fever, stiff neck, slight convulsions, blindness due to optic-nerve atrophy. At end of two months, absence of symptoms of tubercular meningitis or other tuberculosis, of

personal or internal syphilitic indications; the father had contracted a chancre twelve years before, not followed by secondary symptoms. Under anti-syphilitic treatment, ten drops of Van Swieten's solution and 0.05 gramme (three-fourths grain) (*sic!*) of iodide of potassium twice a day (increased later), the child recovered, even as to vision, in a year. The author considers it a case of syphilitic basilar meningitis. (To this diagnosis I must demur, the good effect of mercury and KI are well shown in non-syphilitic diseases of the nervous system, and in the above case there was not a particle of other evidence in favor of syphilis; it was probably a simple meningitis.)

Pathology and Etiology.—Variot and Martin⁵⁵_{Sept. 5} observed a case with no history except that of illness for several days. He presented palpebral ecchymosis, no signs of cranial injury, stupor, episthotonus, fever up to 104° F. (40° C.), distinct left hemiplegia, including face. The autopsy revealed a suppurative cerebrospinal meningitis, the pus being in the intermeningeal space and also in the ventricles. There was, besides, a small abscess in the right hemisphere, just above and outside of the clonus, injuring the internal capsule. A careful search was made for fracture, otitis, vascular disease, and tubercles, but none were found. Warner and Beach⁴⁷_{Apr.} relate the case of a boy, aged seven years, who presented headaches, awkward use of hands and legs, general loss of intelligence, stiff gait, grinding of teeth, irritability, alternation of stupor and maniacal states. No lesion of optic nerves. Became a filthy imbecile, and died at ten years. Father had had syphilis and the mother had had miscarriages. Autopsy showed adhesions between dura and pia over nearly the whole brain. Thick (six to twelve millimetres) false membranes at base and between hemispheres.

Treatment.—Besides what is noted above, it may be mentioned that Duboué and Landion¹⁰⁸_{June 15} have used tannin with great success in doses of about six grammes (ninety grains) per diem. They refer to its successful use by Scotch and French physicians, in larger doses, eight to ten grammes (two to two and one-half drachms) per diem.

PACHYMENINGITIS.

Semeiology and Diagnosis.—The late W. B. Goldsmith, whose premature death is greatly regretted by all who knew his talents and promising capacities, describes²⁷⁸_{Apr.} a case which seemed to him

very obscure, but which we think was clearly one of hæmorrhagic pachymeningitis. A man, aged fifty-seven, was thrown from a tricycle with great force on his head and shoulders (the left frontal protuberance receiving the severest blow) on June 22, 1887. There was momentary loss of consciousness, dizziness, and nausea. In the next few days, though able to go about, he complained of feeling "as if a bullet was rattling around his brain." Six weeks later, this symptom having disappeared, he walked unsteadily, owing to difficulty in using his left leg. August 10th on a yacht was very seasick, and next day severe headache (left frontal) set in, lasting two weeks, with hyperæsthesia of special senses. Headache increased, and gradually stupor appeared, with fantastic positions of body. Incontinence of urine and feces; retention of urine; pulse sixty to seventy; later absolute coma, with slow and Cheyne-Stokes respiration, lasting fully three days. Slight delirium, with hallucinations of sight followed, and consciousness was gradually regained in about three weeks from the beginning of the stupor and four months from the time of injury. Complete recovery. No active treatment by drugs was used. The author is inclined to consider the case as one of multiple minute cerebral hæmorrhage resulting from the blow, but it is much more probable that the injury set up a pachymeningitis, that the vomiting precipitated hæmorrhage from the new membranes, and that recovery occurred by absorption of the clot and of one of the thickened tissues.

Pathology.—Wiglesworth¹⁶⁶_{Jan} makes an elaborate but not very logical argument in favor of the view that pachymeningitis hæmorrhagica is in reality only an intermeningeal hæmorrhage and that the membrane is only an organized thrombus. In the autopsy of four hundred insane he found 10.5 per cent. cases of various degrees of the lesion laminated clot to old membranes. The lesion was by far most common (more than 50 per cent.) in general paralysis. The author's conclusions best exhibit his reasoning: (1) the morbid conditions described under the term pachymeningitis interna hæmorrhagica are not the result of inflammation at all, but are solely due to the effusion of blood beneath the dura mater, the hæmatomata thus formed becoming organized and eventually converted into fibrinous membranes; (2) such effusions of blood are especially liable to occur in the

insane by reason of loss of support sustained by the meningeal vessels, on account of the convolitional atrophy which is so marked a concomitant of insanity, assisted, as this condition so frequently is, by transitory or more permanent congestions; (3) it is because these conditions are most perfectly fulfilled in general paralysis that hæmatomata are more often met with in this disease than in any other form of insanity; (4) . . . (5) whilst in the great majority of cases traumatism may be confidently excluded, there seems reason for believing that, under favorable, predisposing conditions, a slight injury may start a hæmorrhage which may prove fatal. This essay is a good example of the defects of a one-sided study of a subject. The author overlooks the experiments which have been made by injections of blood in the subdural space which would support his theory, and he also utterly ignores the pathology of the disease in perfectly sane persons, which would overthrow his theory of loss of support by atrophy of convolutions. He also does not give due weight to the lesions of the dura itself and the study of *successive layers* found in cases of hæmorrhagic pachymeningitis. Nor does he in any way point out how the blood is effused according to his theory, thus avoiding two serious dilemmas. If the blood were to leave from the meningeal arteries, strictly speaking, it would have to lie between the dura and the bone; if from the cortical vessels of the pia (which we are led to infer is the case), there should always be traces of subarachnoid hæmorrhage, which we do not find. The author's idea that when the convolutions undergo rapid atrophy there is not sufficient serous compensation we cannot admit, as it is contrary to all we know of cerebral physiology. The best statement to make about this disease, in our opinion, is that there are two forms of it, one very rare, in which hæmorrhage from pia vessels occurs on the clot, because "organized," and a second, including by far the majority of non-traumatic cases, in which a true pachymeningitis interna occurs, followed by hæmorrhage from the vascular channels in the young tissue, fresh inflammatory action, renewed hæmorrhages, etc. Duponchel¹⁴ reports a case of a man, aged twenty-five, who had suffered for two months from severe headache, and who was brought to the hospital comatose, with right hemiplegia and contracture with increased reflexes. No etiology except chronic

alcoholism. Death in seventy hours. Autopsy revealed new formation of membrane between dura and pia on left side in frontal region, with one remarkably large, young blood-vessel, which had doubtless given rise to the large intermeningeal hæmorrhage eighty grammes (two and one-half ounces) found. The author rightly thinks that one operation might have been successful.

CEREBROSPINAL MENINGITIS.

Scemiology and Diagnosis.—F. Wolff⁶⁹_{Sept. 20} reports a second attack of the disease after an interval of five years. Out of one hundred and thirty-two cases, eleven had suffered from pneumonia. A sudden onset was always of unfavorable augury, while the recurrence of herpes designated mild cases. The average mortality in his cases, taken from the records of the Hamburg Hospital for the years 1879 to 1886, was 41 per cent., varying in different years from 33 per cent. to 69 per cent. As regards prodromata, they were usually present, and existed for a period of from eight to fourteen days. Frew²¹³_{Mar.} related to the Medico-Chirurgical Society of Glasgow several cases of the disease. The only points of interest in the paper and in the discussion which ensued was the fact that cerebrospinal meningitis was unknown (unrecognized) in Scotland until over four years ago, and that it is still extremely rare. The treatment of the cases reported by Frew and others was such as to show want of knowledge on the subject.

Meriwether,⁴³_{July} after giving a very fair *résumé* of cerebrospinal meningitis in general, reports an epidemic of the disease, which prevailed from January to April, 1888, in Asheville, N. C. Males and females were attacked in about equal numbers. The average age was about eleven years, 80 per cent. occurring in children under fifteen years. The youngest patient was a nursing babe ten months old; the most aged was thirty-eight years. The highest temperature recorded was 107.5° F. (42° C.); the lowest, 97° F. (36.11° C.). An average temperature was 102° F. (38.9° C.). The average duration was three and three-fourths days. One case lasted only three hours (from the initial chill); another four hours; the largest duration was one hundred and fourteen days.

Bristowe⁴⁷_{July} is almost the only one who reports observations upon the fundus oculi. In one case optic neuritis was present, in two cases it was absent (at time of observation). This important

examination should be made in every case of suspected cerebral disease. It is easily done, with or without the use of a 10 per cent. solution of cocaine, in the recumbent position, if the physician will take the trouble to train himself to observe patients in that position. It is certainly harmful as well as painful to oblige very sick patients, especially subjects with cerebrospinal meningitis, to sit up.

C. W. Townsend ⁹⁹_{July 19} read an interesting paper before the Suffolk District (Boston) Medical Society. He gives statistics relative to the mortality from the disease in Boston from 1865 to 1887; also a table showing the number of fatal cases in the principal cities of the world in 1885. He treats of the relation between croupous pneumonia and the disease in question by means of charts constructed from Boston Health Reports, and comes to the conclusion that "ordinary croupous pneumonia has a different origin from the pneumonia which is produced by the same organism as cerebrospinal meningitis, or that certain uncomplicated cases of cerebrospinal meningitis are caused by a different organism from the one which is thought to produce both diseases." The differential diagnosis is carefully considered. He gives notes of two typical cases, one of the fulminant form (death on second day) and one of the intermittent form (death on the eighty-seventh day).

Ulrich ³⁷³_{V.6} ³⁶⁶_{B4.28,H.2} reports a case verified by autopsy in a child, aged two years, during which a well-marked attack of measles occurred. While this was at its height, although the temperature increased, the other symptoms of meningitis, viz.: stupor, hyperæsthesia, and rigidity of the neck, were very much reduced. As the eruption faded the meningitic symptoms again became prominent.

Etiology and Pathology.—Wolff, ⁶⁹_{Sept. 20} in an elaborate paper upon epidemic cerebrospinal meningitis in Hamburg, as observed in the Hamburg Hospital in 1879–86, dwells more especially upon etiological factors. He finds that as regards topography the disease was remarkably limited to certain streets of the city, one hundred and thirty-one in number, being about one-eighth of all the streets in Hamburg. It could not be shown that density of population (with its attendant hygienic faults) influenced the distribution; elevation or depression of the land and all local atmospheric conditions were of no account. The infectiousness of the

disease cannot be great, as many children remained healthy while attending schools in regions where the disease prevailed. The disease was by far the most common from February to June, and, in comparing this fact with meteorological data supplied by the Hamburg Observatory, he finds that this corresponds with the period of greatest dampness. One autumn month which was characterized by an unusual number of cases (September, 1885) was the wettest September in seven years. He holds the "miasm" to be an earth-miasm, very tenacious and not easily transferable. Its essential poison he believes to be both Weichselbaum's *diplococcus intercellularis meningitidis* and Friedländer's *pneumococcus*. In certain cases a psychic cause (fright) may determine the outbreak. Mills and Caball²¹²_{June} do not speak specially of etiology, but the occurrence of five out of their six cases in a locality (Falls of the Schuylkill, Philadelphia) where the disease had been virulent in 1864-5 speaks strongly in favor of the association of the poison with the ground. Dr. Mills suggests that this poison may produce multiple neuritis, either in combination with meningitic symptoms, or as an independent disease. A most important contribution to the pathology of the disease is by Foà and Uffreduzzi.⁵⁸_{B.4.H.1} They refer to their first contribution before the Accademia di Medicina, March 19, 1886, in which they announced the successful culture of the microbe of four cases of cerebrospinal meningitis, claiming that these were the first cases of successful cultures. In the present article they state that in every case they have found the micro-organism which they believe to be the essential factor of the disease, which they call *diplococcus lanceolatus* or *capsulatus*. It is identical with the salivary septic microbe of Pasteur, Sternberg, and Klein, and with Fränkel's *diplococcus pneumoniae*. They advance the idea that croupous pneumonia may be produced by several micro-organisms—cerebrospinal meningitis is produced only by the one they describe—yet evidently admit a close relationship between the two diseases. They describe at length cultures and experiments made with these "meningococci," in rabbits especially. The culture product lost its virulence rapidly after the twentieth and thirtieth generations. Inoculations produced meningitis, pleuritis, pneumonia, inflammatory changes in the spleen and kidneys, and everywhere the microbes were found again. These experiments are well worth reading. The authors were also suc-

cessful in a few attempts at preventive inoculations of rabbits with attenuated virus; using the method of progressive dosage, they produced seven fully protected rabbits. The article is full of valuable and suggestive details, and should be specially studied by those interested in pathology. Meriwether,⁴³_{July} in his account of the epidemic observed at Asheville, North Carolina, mentions the following points. The epidemic prevailed from January to the end of March, producing one hundred and twenty-five cases. As regards causation, the author observes that not one of the ninety-nine cases of which he took notes live on high, well-drained ground. The inhabitants of the town used two kinds of drinking-water, that supplied from a distance by pipes, and that drawn from wells on the premises. It is an instructive fact that nearly all the cases occurred in families using well-water. In 68 per cent. of cases the sanitary condition of the dwelling was "bad," in 22 per cent. "fair," in only 10 per cent. good. Hauser³⁴_{Sept. 4} found an enormous quantity of Fränkel's diplococci and pneumococci in a case of cerebrospinal meningitis. The microbes appeared as lanceolated forms, single or conjoined, frequently showing a distinct capsule. Most of them were found in the exudation, but many were also found in the coats of blood-vessels and within their lumen in the cortex (fewer in the deeper white substance); a few were inclosed in leucocytes, and these showed no evidence of disintegration. No culture was attempted. Griffiths⁵⁹_{Jan. 25} presented two specimens to the Pathological Society of New York, showing purulent exudation in the ventricles. In one case there was no apparent exudation upon the brain; only in the ventricles over a small area of the cerebellum and around the medulla and cord. Northrup stated that he did not know of a case like this in literature. C. K. Mills⁹_{Mar. 3} throws out the suggestion that peripheral or multiple neuritis occurs in some cases of the disease. He had observed this coincidence in three cases. I have notes of two cases in which this coincidence occurred; in one the multiple neuritis involved many nerves and recovery was never complete; in the other, nerves of the legs were affected, and a complete recovery had taken place before the patient was seen. With the present views of the pathology of cerebrospinal meningitis, it is perfectly intelligible why peripheral neuritis should occur as well as optic and acoustic neuritis. Hun⁶²¹_{Aug.} reports a case of coincident cerebrospinal menin-

gitis and lobar pneumonia in a child, aged thirteen years. The disease was of mild type, and, with antipyrin as chief remedy, convalescence occurred on seventh day. In this case decided cerebral symptoms preceded the pulmonary symptoms. Mason⁹⁹_{July 19} records case of boy, aged five years, who recovered in nine weeks after symptoms of meningitis, pneumonia, herpes, and tender joints. A relapse of meningitis two months after discharge from hospital proved fatal; no autopsy. In the same journal are other interesting cases by Jackson, Rotch, and Jacob, and a discussion of the subject by various physicians of Boston. Sears⁹⁹_{Aug. 9} calls attention to the frequency of pharyngitis during epidemics of cerebrospinal meningitis, and refers to the American epidemic of 1811-15 as a striking illustration. Roux²¹¹_{July 15} reports a case observed in the Military Hospital of Lyons in which during life the symptoms of cerebrospinal meningitis predominated, but where the autopsy showed well-marked ulceration of Peyer's patches and enlargement of the spleen, as well as meningeal exudation. Cultures from the meninges and Peyer's patches were unsuccessful, but those from the spleen gave colonies of bacteria somewhat resembling those of typhoid fever.

Treatment and Prognosis.—Mills and Cahall²⁴²_{June} noticed the good effect of opiates, and also observed unexpected good results from the exhibition of five grains (0.32 gramme) of potassium iodide (a useless dose) with one-forty-eighth grain (0.0014 gramme) bichloride of mercury three times a day. (May the mercury act as a germicide?) Meriwether⁴³_{July} used physostigma (dose not given) and morphia satisfactorily. Antipyrin in doses of from five to ten grains (0.33 to 0.66 gramme) by the mouth, or twenty to thirty grains (two grammes) per rectum also acted well, producing rest and lowering the temperature. Blisters and hot baths are recommended, the former after the most acute period. He rightly insists on quiet and good nursing as most desirable. Recovery occurred in 52½ per cent. of cases.

Bristowe⁴⁷_{July} has obtained good results from iodide of potassium and mercury, and is inclined to think "that judicious nursing and attention to small and various details is of more real value than drugs." Two out of three cases reported by Bristowe recovered. Gaston, of Atlanta,²³⁴_{June} advocates a return to the old-fashioned treatment by purgatives (calomel especially) and quinine,

later with turpentine, camphor, etc. He considers it wrong to clog the secretions and benumb the sensibilities by anodynes,—a view which will hardly be accepted, and which is derived from the author's idea that "incipient congestion" should be recognized as a basis of treatment. Of the specific nature of the disease not a word is said, nor does the author seem to recall that the action of calomel on the liver has been repeatedly disproved. Stephen²_{June 9} calls attention to the "great value" of antipyrin in this disease. He usually gave forty-five grains (three grammes) distributed over the evening and night, and considers that its "success in this disease depends less on its property of reducing temperature than on its power to quell those nerve storms which are one of the principal causes (?) of death in this disease."

TUBERCULAR MENINGITIS.

Semeiology and Diagnosis.—Bossclut,¹²⁰⁷ reflecting the teaching of Professor Damaschino, insists that the disease is far from rare in nursing children, and that the diagnosis is very difficult, especially from acute otitis. This statement is well illustrated by a case reported as one of meningitis with purulent effusions by Crittenden,⁸¹_{July} in which, with well-marked meningitic symptoms, nearly an ounce (thirty-one grammes) of pus was removed from one middle ear and the infant recovered. Elsner¹⁷⁰_{Mar.} writes a good paper on the early diagnosis of the disease by a study of the following symptoms: altered disposition, headache, which is acute and peculiar; vomiting, which is not preceded by nausea or followed by prostration; constipation, cerebral macule, ptosis and cerebral paralysis, convulsions, irregular pulse and fever. He justly claims that the disease very rarely begins without prodromata, and points out that in this stage deceptive remissions occur. No mention is made of changes in the optic nerves, which I consider of much importance. R. N. Taylor²²⁴_{June 9} reports an interesting case of tubercular meningitis in a youth of seventeen, who developed severe headache on February 24th, four days after a bruise of his right testicle on the 20th of the same month. When seen, sixteen days after injury, there were headache, apathy, pulse of fifty-five, temperature of 101° F. (38.3° C.). The right testicle showed a hard nodule on its upper part, size of a hazel-nut. Later, more distinctly meningitic symptoms developed, and death occurred on twenty-

second day after appearance of severe headache. Autopsy refused. The relation of the meningitis to the lump in the testicle is open to question, but it certainly could not have been in relation with the blow, received only four days before severe headache. It also appears that some headache had existed for four weeks. Possibly the "lump" was really tubercular, but of much more ancient date. Gevaert²⁷⁶_{Jan. 5} reports a case of suddenly developed tubercular coxitis (in second stage). Death in convulsions, in six or eight hours.

Pathology and Etiology.—Blanche Edwards¹⁵²_{July 31} observed case of child, six months old, in whom a very diffused tubercular meningitis seemed to depend upon a tracheo-bronchial adenopathy. The point of greatest interest is the early age at which the bronchial affection occurred. In one hundred and one observations by Baréty the youngest case was eight months of age and the average age from three to six years. The mesenteric glands are usually diseased in the youngest infants. Weill²¹¹_{Sept. 16} reports a fatal case of the disease in a girl, aged seventeen years, who had never menstruated. Intense headache, pain in loins, right hemianæsthesia, paresis of right arm and of left leg, stiffness of neck (on sixth day), paresis of both legs, trismus. There was tubercular meningitis of the convexity of the left hemisphere. The mucous membrane of the uterus was transformed into a caseous tubercular mass.

Treatment and Prognosis.—Iodoform has again been praised by Lemoine. He gave it internally in doses up to eight grains (0.518 gramme) a day for three months (!) with the happiest results; no toxic action. It was administered in capsules. Garrison¹⁹_{June 25} describes a very doubtful case, which recovered after the application to the shaven scalp of an ointment of iodoform and adeps, one to seven, applied under oiled skin every eight hours. Antipyrin and antifebrin (the former the better) gave good results in a case observed by R. Park.⁶_{May 14} The author is inclined to consider the case one of rheumatic meningitis. Remarkable reduction of fever (from 105° F. to 98.6° F. [40.55° to 37° C.]) was obtained in six hours by the antipyrin, with general improvement. Bystrow¹¹⁶_{Sept.} saved two of three cases in which the symptoms pointed clearly to tubercular meningitis by the use of ice and counter-irritants to the head and the administration of iodide of potassium. The diagnosis (which the author does not positively formulate) is much shaken by the fact that simple meningitis with hydrocephalus was

found in the one case that died. Bristowe⁴⁷_{July} reiterates his belief in the possibility of recovery from the disease. Lemoine⁷³_{Aug. 11} reports a case of recovery from the disease in a girl, aged fifteen years, by the use of iodoform administered internally. He had also observed remarkable results in tuberculosis of the abdominal organs. He administered it in the shape of Clertan's capsules, containing iodoform dissolved in ether, and gave as much as four grains (0.26 gramme) twice a day.

CEREBRAL SYPHILIS.

Semeiology and Diagnosis.—Oppenheim⁴_{July 16} reports a most interesting case of intermittent [not "oscillating," as the author writes it] bitemporal hemianopsia, which was shown to be due to gummatous infiltration of the anterior angle of the chiasm and of the medial aspects of the nervi optici. He attaches great value to this symptom (bitemporal hemianopsia) as suggestive of syphilis. The intermission or remission was quickly obtained by KI given in doses of three grammes (46 grains) per diem. He refers to another similar case, and, in connection with this, very judiciously states that the localization laws must be carefully applied to syphilitic cases because of the frequency of multiple lesions. In this second case a right-sided hemiplegia with paralysis of the left third nerve was not due to one lesion involving the crus, but to two lesions, one of the third nerve itself, the other of the left internal capsule. McCall Anderson²_{Sept. 25} discusses at length the diagnosis and treatment of nervous syphilis in an article well worthy of perusal. He rightly insists upon the frequency of these affections, though he underestimates their appearance within a few months after infection and does not lay sufficient stress upon the fact that syphilitic nervous affections not rarely occur in patients who have had no symptoms from the time of the initial lesion. He lays stress upon the great variety of symptoms presented, which are yet susceptible of a certain grouping highly useful for diagnostic purposes.

Fournier²¹²_{Jan.} elaborately describes various nervous symptoms of syphilis, premising that certain predispositions, habits, and sex have a marked influence in determining the nature and intensity of the symptoms. 1. Headache, may be due to exostosis, to implication of a nerve, or may be a true diffused deep-seated headache, fronto-temporal, aggravated at night. It may be continuous or

paroxysmal. Rapid recovery follows upon treatment by protoiodide of mercury (0.05 [$\frac{1}{5}$ grain] to 0.10 [$1\frac{1}{2}$ grains] *ter die*) and KI (one gramme [15 grains] *ter die*). 2. Syphilitic insomnia, independent of cephalalgia, is more common in women during the secondary period. 3. A neurasthenia with profound impairment of nutrition, with fever and sweating in some cases. 4. Various neuralgias, more especially of the trigeminus. 5. Anæsthesia and analgesia in patches, more usually about the mammae, on the dorsum of the hand, and over extensor surfaces generally (as in saturnine intoxication). This symptom may be exceeding rebellious to treatment. In the same journal for May the author continues his enumeration of peculiar manifestations of syphilis. Hysterical and epileptic symptoms are reawakened or intensified by syphilis; various disorders of peripheral circulation and colorification are enumerated as results of syphilis, excessive sweating occurs in women in the secondary stage, visceral neuroses are produced, also anorexia and boulimia.

Etiology and Pathology.—Siemerling ⁷⁵_{Jan.1} reports case of a girl, aged twelve years, whose father was syphilitic. She suffered from many symptoms pointing strongly to cerebellar lesion, but the autopsy showed great internal hydrocephalus, a peculiar lesion of the cerebral pia consisting of general thickening with granulation tumors of minute size penetrating the cortical substance. The blood-vessels distinctly showed the changes described by Heubner. The cranium was extremely thin. A most interesting discussion on the pathological anatomy of spinal syphilis, in which Jürgens (who presented specimens of two cases), Leyden, Oppenheim, and Bernhardt participated, took place in the Society for Internal Medicine of Berlin. ⁶⁹_{June 22} There seemed to be a unanimity of opinion that a strictly limited syphilitic myelitis is very rare, and that meningeal and osseous lesions are by far more common. Leyden and Bernhardt admitted a syphilitic peripheral neuritis, and the last-named speaker suggested (as Landry himself had done) that acute ascending paralysis might be sometimes of syphilitic origin. At a subsequent meeting ⁶⁹_{July 5} Leyden demonstrated sections of the spinal cord of Jürgens's case of vertebral lesion, the chief point of interest being the small degree of lesions of the cervical cord, in contrast with the complete paraplegia with total loss of reflexes exhibited by the patient. Spillmann ¹³_{Mar.15} describes two cases of

syphilitic aneurism of cerebral arteries; one of the basilar artery in a subject, aged twenty-seven years, dying eleven months after infection; the second in a man, aged twenty-one years, dying eight months after infection. In both cases death occurred through bursting of the aneurism. Histological study of the aneurism showed a lesion mostly of the internal coat with atheromatous changes. The author states that the basilar and Sylvian arteries are more apt to be the seat of syphilitic aneurism. Schmitt¹⁸⁴_{June 1} reports a case of hemiplegia due to cerebral arteries developed six months after a chancre; a second attack of hemiplegia three months later proved fatal in four days. The autopsy showed extensive syphilitic endarteritis in many cerebral vessels, more especially in the two Sylvian arteries. He urges energetic mercurial treatment.

Syphilitic endarteritis has been demonstrated by Siemerling⁷⁵_{Jan. 1} in a girl at twelve years suffering from inherited (paternal) syphilis.

Schmitt, of Nancy,¹⁸⁴_{Oct. 1} relates three cases of anaesthesia occurring within the first six months after syphilitic infection, in male subjects free from all suspicion of hysteria. In two there was universal analgesia, without anaesthesia or affection of the special senses; in the third case all forms of sensibility and the special senses were affected in one-half of the body. Two cases were cured and one improved by mixed treatment. The same author,¹⁸⁴_{Nov. 1} after relating a case of fatal multiple cerebral syphilis, gives a minute study of the lesions found in the cerebral arteries, and combats Heubner's view of the nature of endarteritis syphilitica. The latter author, as is well-known, claims that the initial lesion is an accumulation of young cells in the innermost or endothelial lining of the vessels, while Schmitt endeavors to show that the inflammatory changes, with large increase of young cells, take place in the subendothelial layer. The argument seems rather forced, and Schmitt's figures do not justify his strong verbal opposition to Heubner.

Moravcsik⁶⁸_{Oct. 15} describes the lesions found in the brain of a woman suffering from tardy cerebral syphilis, with many hysterical symptoms, as is so frequent in feminine syphilis. Besides a coarse lesion (gummatous infiltration of the right island of Reil) there were diffused leptomeningitis and periencephalitis. The microscope revealed widely distributed minute changes in cortical

ganglion cells, in the cells of the cerebellum, and in the vessels of almost all parts of the brain. Both cornua were much atrophied; Heubner's endarteritis syphilitica was present in many vessels.

Treatment and Prognosis.—McCall Anderson²¹³_{Apr.} reports a case of well-marked cerebrospinal syphilis in a woman, aged thirty-nine, remarkable for the severity of symptoms, which yielded to treatment. Strange to say, treatment so imperatively indicated from the first was not begun until six weeks after admission to hospital, and then the iodide of potassium was given in doses of ten grains (0.65 gramme) three times a day. Marked improvement was apparent in three weeks. This case well illustrates how slowly the knowledge of the need of energetic and even heroic treatment of nervous syphilis is spreading. This patient might have been rapidly *cured* soon after her admission to hospital. The same lesson may be learned from a case reported by C. Handfield Jones,²²_{Sept. 5} in which a case of syphilitic meningitis, caries of the frontal bone, abscess of frontal lobe, indicated by convulsions, paralysis, and choked disks, was treated by what the author calls "full doses" of KI, which did not exceed twenty-five grains (1.62 gramme) *ter die*, and mercury was not used till a few days before death. Schuster, of Aaschen,²⁸_{Jan.} writes quite an exhaustive summary of the progress of treatment in the last thirteen years. Of American writers he mentions only Bumstead and Taylor, and while great stress is laid upon the necessity of energetic mercurial treatment by baths, imunctions, injections, and internal administrations, too little is said of the large doses of KI. The largest doses quoted from various recent writers are four to six grammes (62 to 93 grains) *ter die*. The American method of giving KI in late syphilitic affections of the nervous system is here completely ignored, in spite of the testimony as to its wonderful efficacy. Instead of four to six grammes a day, the dose should be from twenty to thirty (five to eight drachms), and even in some cases to sixty grammes (fifteen drachms) a day. These doses are perfectly well borne by the majority of patients, and the results obtained are most surprising.

McCall Anderson's able address,²_{Sept. 29} on the diagnosis and treatment of syphilitic affections of the nervous system was followed by a discussion which voices the opinions of the leading English physicians on the subject of treatment. Grainger Stewart, Drum-

mond, Ross, Clouston, Robertson, Bramwell, and Dowse were the principal speakers. All substantially agreed as to the necessity of combined or mixed treatment, and a tendency to the advocacy of larger doses of KI than usually employed in Europe was shown. Still, the largest doses mentioned were by Bramwell, who gave "even sixty grains (3.88 grammes) several times a day." There was also a general expression of opinion in form of keeping up specific treatment for a long time after the subsidence of the acute symptoms.

An interesting paper on the *prognosis* of syphilis of the nervous system by Naunyn⁴¹_{Nov. 1} includes the following points: In cases of syphilitic tabes and dementia paralytica and polyneuritis, the prognosis depends more upon the extent of lesion present than upon its etiology. Excepting these diseases, the prognosis of such affections is favorable, especially if an early diagnosis be made, and if not more than ten years have elapsed between infection and the occurrence of the symptoms treated. In his own experience, out of eighty-eight cases, twenty-four were cured, forty-nine improved, ten unimproved, and five died. He cites Fournier as reporting, in ninety cases, thirty cured, thirteen improved, thirty-three unimproved, and fourteen deaths. Under energetic treatment improvement should appear before the expiration of two weeks, if a favorable prognosis is to be given. By "energetic" treatment the author means inunctions of unguentum hydrargyri, from four to ten grammes (one to two and one-half drachms) a day, and giving KI in doses of one to three grammes (fifteen to forty-six grains) a day for eight to ten weeks. Very little is said of after-treatment, though it is recommended that some KI should be given occasionally for a year or more. If our Continental *confrères* would only try the American method of giving iodide of potassium in nervous syphilis, *i.e.*, in doses of from two to ten grammes (one-half to two and one-half drachms) *ter die*, they would soon obtain better results. With us, if recognized in time, very few cases of nervous syphilis (excepting, of course, dementia paralytica, and tabes, which few believe to be truly syphilitic) fail to get well or to be greatly improved. The after-cure is most important, and it is my practice to give Hg and KI during alternating periods of one or two months (in full doses) for at least two years after the last active manifestation of the disease.

PARALYSIS AGITANS.

Semiology and Diagnosis.—Teissier²¹¹_{Jan. 9} reports cases showing œdema, and also one case in which the typical symptoms of the disease were produced (!) by a spinal pachymeningitis. Heimann, in an essay,¹²⁰⁸ analyses nineteen cases. The only peculiarity in his report is that the hemiplegic form was rare. Emotional causes are most potent; in no case could heredity be determined; as to sex, fifteen males and four females were counted. In two cases there was tremor of the head. The tremor varied inversely as the rigidity. L. Weber²¹²_{June} read an analysis of twelve cases before the New York Neurological Society, in which he related the various usual symptoms. In the discussion that followed no new points were brought out. Mesnard⁷⁰_{Sept. 2} reports a case remarkable because of its beginning bilaterally in the toes and feet, and because the muscles of phonation as well as the tongue were the seat of rhythmic tremors. Exposure to dampness and cold was the apparent etiological factor.

Pathology and Etiology.—Teissier²¹¹_{July 8} presents a preliminary statement of results of three autopsies of this obscure disease, in which he claims to have found chiefly a slight or diffused sclerosis of the lateral columns, besides some lesions (not mentioned) of the pons. The lateral sclerosis extended almost to the columns of Clarke. Nothing is said of the state of the cerebrum. The author makes several extraordinary statements in his paper which do not favorably impress one familiar with paralysis agitans. He says that it is generally recognized as a *spinal* affection, and by the mention of two cases leads the careless reader to suppose that vasomotor symptoms (œdema) and pains of spinal nature are common. In our experience the œdema is extremely rare, and the pains are muscular and due either to strain in maintaining equilibrium or to rheumatic conditions. The whole clinical history of the disease points to a cerebral origin, to a lesion of the motor zones, and the finding of partial sclerosis of the lateral columns would harmonize perfectly with this view. We have long believed that the lesion of paralysis agitans will be found in the upper pyramidal tract and motor cortex. In one case of Heimann's an autopsy by Oppenheim yielded "negative results." Gauthier²¹¹_{Aug. 20} makes an ingenious plea for an idiomuscular theory of the pathology of the disease, which is, however, seriously embarrassed by the fact, the unques-

tionable fact, that the symptoms often or almost always assume a hemiplegic distribution. Besides, nothing that we know of the state of the affected muscles, by electrical reaction and post-mortem study, supports such a theory. He finds heredity of nervous disease extremely rare, and he had an unusual opportunity of personally knowing the families in which his six cases occurred. Hughlings-Jackson^{47 Jan.} states that he has (previously) submitted the hypothesis "that in paralysis agitans there is wasting of cells of the middle motor centres (so-called "motor region" of the cortex) in order from smallest toward largest cells."

Treatment and Prognosis.—Heimann¹²⁰⁸ relies on rest, tincture of veratrum viride (five drops three times a day), and morphia as palliatives. In a discussion in the New York Neurological Society^{212 July} no one claimed to have obtained more than a palliation of symptoms by any treatment, except Rockwell, who stated that a patient of his treated with hyoseyamine, one one-hundredth grain (0.00065 gramme), and galvanism returned to his home "apparently cured." Hyoseyamine is the drug which had given most relief in the experience of various speakers. In this connection I would make the following statement, in view of the fact that in the last few years various writers and teachers have spoken and written as if the use of hyoseyamine was original with themselves. Hyoseyamine (or hyoscine), crystallized and of Merck's fabrication, is the only drug which stops the trembling of the disease with certainty and gives comfort to patients. The credit of its introduction is due to Charcot, who prescribed it in doses of 0.001 gramme (fifteen one-thousandths grain) as early as 1867 or '68. Charcot himself has not published his experience, a bare reference to the fact being furnished in Ordenstein's essay (1868). I was the first to use the alkaloid in this country, and systematically, for the treatment of paralysis agitans. In 1879 I first used it^{355 v.250} in a typical case by the mouth and hypodermically with wonderful (temporary) results, and have continued to use it more or less in all cases. The dose by the mouth should be one one-hundredth grain (0.00065 gramme) given twice or thrice a day; by hypodermic injection from one one-hundred-and-fiftieth to one-fiftieth grain (0.00043 to 0.0013 gramme) once or twice a day. The certainty of relief is remarkable. One can promise complete cessation of tremor and stiffness for two or four hours after a hypodermic injection of hyoseyamine

of one one-hundredth or one-fiftieth grain (0.00065 to 0.0013 gramme) according to the susceptibility of the patient. No good effect is obtained unless some dryness of mouth is produced, and the larger doses produce, besides, failure of accommodation, flushing, and sometimes hallucinations and delirium. Still, on the whole, patients afflicted with this disease are very grateful for the judicious use of hyoseyamine. The drug is also useful in other disorders of movement. I join the writers in the statement that, thus far, no treatment is of real utility in this disease.

TUMORS IN GENERAL.

Scmciology and Diagnosis.—Webber⁹⁹_{Sept. 21} makes a very interesting report of four cases of cerebral tumor, one of which is noticed elsewhere and two of which are still living. These presented most interesting localization symptoms, and it is to be hoped that the author will be able to complete the study of the cases. His second case presents a beautiful example of multiple (thirty-two) melanotic sarcomata in the brain. The duration of the illness was about sixteen months, and, as might well be supposed, the symptoms were various and clearly pointed to multiple lesions. Hæmorrhagic neuroretinitis was present. The primary deposit was not clearly determined, and, unfortunately, the cord was not examined. In connection with Webber's last case, I feel it a duty to call attention to the common error of giving disproportionate doses of bromide and iodide of potassium in cases of cerebral lesions with epileptiform symptoms. For example, in his Case IV, Webber gave twenty-five and fifty grains (1.62 and 3.24 grammes) of KI and twenty grains (1.3 grammes) of KBr, three times a day, at one time; later, the KBr was reduced to fifteen grains (0.97 gramme) three times a day. In one experience we have found such patients very sensitive to KBr, being weakened by it generally and the paresis increased; whereas the dose of KI can be pushed to thirty or fifty grammes (eight to thirteen drachms) per diem (if properly diluted) without bad effect. In such cases we advise keeping the KBr down to doses of ten or fifteen grains (0.65 to 0.97 gramme) three times a day, which is enough to restrain cortical discharges.

A fatal case of tumor of the left auditory nerve (an extremely rare lesion) is reported by S. J. Sharkey,¹⁷_{Apr.} male, aged forty-one years, who had not had syphilis. Symptoms: Giddiness and par-

oxysms of direction vertigo, with apparent rotation of objects to the left; frontal and vertex headache, double optic neuritis, epileptiform attacks, with (at the last) more twitching of right limb; tinnitus, and total deafness in left ear. No paralytic phenomena were observed, though it seems strange that the seventh nerve should have escaped compression. As points of diagnosis between Ménière's vertigo and tumor of the auditory nerve, Sharkey points out the facts that increase of tinnitus did not accompany attacks of vertigo and that there was choked disk. Duration of illness a little over one year. A tumor, size of a large horse-chestnut, lay against the petrous bone partly in the enlarged internal auditory meatus. It included the auditory nerve and simply pushed aside the seventh and tenth nerves. It was a spindle-celled sarcoma. The internal ear was healthy. It is a pity that the electrical reaction of the acoustic nerves was not observed. Middleton²¹³_{Apr.} relates a case of gliosarcoma of the pons in a child four and a half years old, chiefly interesting because of its clear traumatic etiology. There was no distinct crossed paralysis, but increasing bilateral paresis, with titubation, or, rather, ataxic walk.

Pathology.—Bullen,¹⁶⁶_{Jan.} reports multiple tumors of the cerebral cortex in a case of cancer of the right lung and upper mediastinum. Tumors (sarcomatous) of size of pinheads to that of peas on many gyri. No localizing symptoms. Brainerd⁴⁴_{Sept.} reports a case of sarcoma of the right parietal lobe (including postcentral gyrus). It was so incompletely observed as not to be useful for localization purposes, but it is very instructive as showing that a sarcoma may occur in a supposed syphilitic subject (chancre, etc., ten years before), and that iodide and bromide of potassium may afford unexpected relief to symptoms in such a case.

Buzzard⁴⁷_{Apr.} reports a case of round-cell sarcoma of the right side of the pons and inferior aspect of the cerebellum. The symptoms were staggering to the right, paralysis of the sixth, seventh, and eighth nerves, and partial paralysis of the fifth, ninth, eleventh, and twelfth nerves, with apparent paralysis of the legs at the last. No optic neuritis. The case is of importance for differential diagnosis between periostitis of the base of the skull, excruciating and nocturnal headache being absent. The tendency to stagger off to the right is explicable by the fact that the lesion involved the right lateral peduncle of the cerebellum.

Borgherini⁵⁷_(Oct. 22) reports a tumor of the tela choroidea of the fourth ventricle quite filling up the space between the calamus and the vermis inferior cerebelli; size, 3.2 centimetres long (frontocaudal dimension), 2.1 centimetres wide. The histology of the tumor was not fully made out, but it consisted largely of blood-vessels, round cells, with large nuclei imbedded in a fine connective-tissue stroma. It seemed to be a transformation of the tela. Apparently no symptoms had been produced by it during life, as the subject had committed suicide while in apparent health.

Coats²_{May 5} reports a case of multiple carcinoma of which the primary tumor was probably that in the lungs. There were secondary tumors in most of the organs, those in the bones and brain being cystic. In the brain were twenty-four tumors, all cystic but one, varying in size from two inches to one-quarter of an inch in diameter. A great variety of cerebral symptoms, but no definite paralysis, were observed (by Professor Gairdner).

Gliosid of the Cortex.—Under this title Fürster and Buchholz³⁶⁸_{B.I.IV,p.59*, Nov. 1}⁷⁵ describe small granular or rounded masses in the cortex of the brain, visible to the naked eye. Histological examination by Buchholz showed in the centre of each granule a degenerated (obliterated) blood-vessel, often showing radiating spider-cells extending into the tumor, which also contained few cellular elements, mostly spider-cells and fibrillar elements. In other granules there were concentric layers of connective tissue with elongated nuclei. The walls of the cavity containing these tumors were made up of condensed layers of tissue (neuroglia), in which were numerous nuclei and a few vascular elements. The author supposes that the starting point of these little tumors is in a transformation of blood-vessels. The ganglion cells of the cortex were slightly if at all reduced in number, but many nerve-fibres were destroyed by gummata.

Treatment.—In connection with this subject it may not be out of place to place on record the remarkable experience of Lucas-Championnière.³_{June 13} Since 1874 he has trephined fifteen times without death or bad symptoms, although he used the old method of small openings. The therapeutic results are not stated with precision; but of six cases of severe cranial pain or vertigo, some were relieved, others cured; of four cases of "idiopathic" epilepsy, no satisfactory result can be reported; in two cases of distinctly traumatic epilepsy "very good" results were obtained.

DIFFUSED CEREBRAL SCLEROSIS.

Schmaus²⁰_{Oct.} reports case of a child, three years of age, presenting spastic extremities with increased reflexes, divergent strabismus with horizontal nystagmus, sensibility apparently normal. State of optic nerves not mentioned. Muscles very small, but reacting normally to faradism. Autopsy showed extreme cerebral atrophy, brain and cord together weighing only three hundred and eighty grammes (twelve ounces seven drachms) (normal one thousand grammes [thirty-two ounces one drachm]). Internal and external hydrocephalus, internal pachymeningitis, sclerosis of many gyri; cerebellum slightly atrophied. Histological examination showed changes mostly in neuroglia of gray and white substances of brain and of cord; comparatively little changes in ganglion cells; few spider-cells. In cord, degeneration of pyramidal tracts and of ascending cerebellar fasciculi; also isolated patches of sclerosis. Sensory fasciculi (including Clarke's columns) almost normal. The author seeks to establish a distinction between diffused cerebral sclerosis and dementia paralytica by the fact that in the latter the nervous elements are early and much involved, and that spider-cells are very numerous. Chronic inflammation of the pia is present in both conditions.

DISSEMINATED CEREBROSPINAL SCLEROSIS.

Semeiology and Diagnosis.—Under the title of "Pseudo Sclerosis," Maguire⁴⁷_{Apr.} reports a case of male, aged forty-nine, with ataxic tremors, slow, tremulous speech, dementia, and increased reflexes. The optic nerves showed some atrophy; no nystagmus was present. The tremor had existed for nearly nine years. Syphilis had been contracted twenty-two years before. Under KI in ten-grain (0.65 gramme) doses, with a night draught of bromide of KBr, and chloral at bed-time, great improvement occurred. A relapse was reported later, but the patient was lost sight of. The author attempts to assimilate his case to Westphal's two cases of functional sclerosis-like disease,²⁶⁸_{Bd.14,p.57} in which no lesion was found post-mortem; but it seems to me that most likely the case was one of syphilitic dementia paralytica, in which condition tremors are sometimes very ataxic and very marked. Stephan²⁶⁸_{Bd.18,II.3; Bd.19,II.1} concludes, from a critical study of the tremors of disseminated sclerosis, that they are dependent upon foci of sclerosis

in the brain, and more especially on foci situated in the thalami. Huber³¹_{Scpt 21} observed temporary and variable allochiria in the lower extremities of a patient having this disease (confirmed by autopsy). At the time of finding allochiria there was a degree of tactile anaesthesia. Among many lesions extensive sclerosis of the lumbar posterior columns was found. Westphal³⁰⁹_{B.L.113,p.459} reports two cases of the disease in boys, aged respectively nine and eleven years. Motor phenomena and atrophy of optic nerves and nystagmus were observed, but sensibility was unaffected, and no tremor was present.

Pathology and Etiology.—Moncorvo, of Rio de Janeiro,³⁰⁶_{B.L.28,H.2} has made a special study of this subject, and finds that hereditary syphilis is a most important factor in the genesis of the disease. The author records only seventeen cases in the literature pertaining to the subject, and he had personal experience with four additional cases. He was able to confirm Charcot's statement that the disease was more common in females than in males, twelve cases occurring in girls and nine in boys. The disease may begin in very early life, having been observed as early as the seventh month, while the greater number of cases occur between the third and fourth years. It was found difficult to prove the influence of heredity, and yet a certain relationship between antecedent infectious diseases and disseminated sclerosis could not be overlooked. The investigations of Marie and Jendrassik show that the infectious or poisonous matter penetrates the circulation and directly injures the vascular system. The process begins in the perivascular spaces, gradually implicates the surrounding tissue, and causes atrophy and destruction of the nervous elements. The author does not accept these views unreservedly, with regard to the formation of sclerotic deposits in connection with the febrile infectious diseases, but he believes that syphilitic virus may be a means of causing the disease. A case occurring in a child three years of age is narrated, in which the symptoms of disseminated sclerosis were well marked, and there was also a history of hereditary syphilis. Prolonged mercurial treatment caused a disappearance of all the troublesome symptoms. The importance of sudden mental shock or fright in the production of disseminated cerebrospinal sclerosis is insisted upon by Focke.¹²⁰⁹ He relates one case in which the symptoms began immediately (?) after the sudden death of patient's father in her arms, and in which the diagnosis was verified

by the autopsy. Also, two other cases, still living, in which the semeiology points pretty clearly to the existence of the disease. The author found many cases in literature having a similar apparent origin. He would explain the *modus agendi* of fright by its action on the blood-vessels of the central nervous system, thus leading to changes in the tissues. Schoenfeld,¹²¹⁰ under the guidance of Mendel and Eulenburg⁷⁵_{Sept. 1} treats of the influence of infectious diseases, and relates two cases in which the symptoms of sclerosis followed diphtheria. Cases have been observed by various French and German authors after typhoid fever, small-pox, scarlatina, measles, dysentery, cholera, and pneumonia. Hess⁴¹_{Nov. 29} made a careful microscopic study of foci of sclerosis in the cord of a patient (brain not allowed to be examined) and found that in many patches the myeline had disappeared, leaving the axis cylinders. He finds in this a verification of Schultz's (?) law that lesion of the myeline does not lead to secondary degeneration, and he also thinks his case supports the views of Rindfleisch and others that the initial change in sclerosis is the myeline, as against Adamkiewicz, Schultze, and Babinski's idea that the primary lesion is the small blood-vessels, conducing to proliferation of the neuroglia and destruction of myeline. Cræmer³⁶⁸_{Bl. 19, H. 3} has observed the co-existence of beginning spinal disseminated sclerosis and acute myelitis in a girl aged nineteen years. The paraplegia followed after measles two years before death. The brain was normal. L. C. Gray⁵⁹_{Sept. 1} reported to the American Neurological Association the autopsy of a patient who exhibited during life many of the symptoms of this disease. The lesions found were those of leptomeningitis.

Treatment.—Grasset and Sarda⁷³_{July 7} have observed a remarkable subsidence of tremor in this disease after the use of solanine. Doses of 0.05 gramme given from three to five times a day diminished the dyspnœa, and almost absolutely stopped the volitional tremor. The tracing given is much more like that of paralysis agitans than of sclerosis, quite perfectly rhythmical. In four days the tremor completely ceased, then reappeared in six days after the remedy had been omitted, though it did not reach its original intensity before twenty days. In a second trial, after six days' use of the remedy, voluntary movements were done without tremor, nor, eight days after stopping the treatment, had it reappeared. No special tolerance of the drug was established.

CYSTICERCUS OF THE BRAIN.

Gerhardt⁴_{May 14} presented specimens of these affections to the Society of Charité Physicians of Berlin. The symptoms during life consisted in right-sided epileptiform spasms, and the presence of subcutaneous cysticerci in various regions; death by pneumonia. An interesting discussion followed, with statements as to new cases and points for diagnosis by Lewin, Oppenheim, Siemerling, Remak, and Bernhardt. It appears that these observers rely on the demonstration of an external cysticercus (under skin or in the eye) for the diagnosis of the cerebral parasite. An interesting editorial article²_{Aug. 20} on the subject gives many statistical data.

Clavoy¹⁸_{Jan., Feb.} describes the microscopic characters of cysticerci found in the Rolandic region of a man (who had during life presented Jacksonian epilepsy, paresis, etc.), and comes to the conclusion that the scolex of these cysticerci is absolutely like that of *tænia solium*, but very different from that of porcine cysticerci.

VARIOUS CEREBRAL LESIONS AND SYMPTOMS.

Importance of Eye Symptoms in the Study of Nervous Diseases.—Two articles have appeared on this subject which are not well adapted to analysis. One by Tangeman¹²¹_{Aug.} of more general scope is worthy of study by the general practitioner, though marred by some rather sweeping statements and by several serious typographical errors. The other, by Swanzy, of Dublin,²²_{Nov. 14} is extremely good, and contains references to a considerable number of well-observed typical cases.

Tremor Rate in Disease.—D. Williams,²_{May 19} starting from Schäfer's assertion that the tremors which make up a normal muscular effort occur at the average rate of ten per second, has investigated the tremors of paralysis agitans and of Basedow's disease, etc., by means of a graphic apparatus. In the latter disease the movements were recorded at an average rate of 11.3 or 11.5 per second. In paralysis agitans the rate was 5.1 and 5.2 per second, but by increasing the rapidity of the cylinder he was able to show a dirotic or double wave of twice the rate given. In a case of lateral sclerosis the rate was 5.2, but the oscillations were also partially double (greatly resembling a pulse tracing. In a case of disseminated sclerosis, the oscillations were single at a rate of 5.8. In senile tremor the rate was 5.5 per second with many

irregularities. In conclusion, the author states that pathological tremors never exceed the rate for average tremors, and that the oscillations are often double. In pathological cases there are exaggerations of the amplitude of normal oscillations, and often a fusion of vibrations producing a slower rate (about one-half the normal rate).

Paralysis by Exhaustion.—Féré⁴⁷_{July} puts a new face on old facts, explaining the paralysis produced by overexertion of certain muscular groups in hysterical subjects. He relates two cases—one of a smith, who produced right hemiplegia by overuse of his hammer, and that of a girl, aged fourteen years, who developed left hemiplegia after excessive piano practice. In both more or less hemianæsthesia was present; the muscular sense for the forearm and hand was completely lost; the leg recovered rapidly and the arm slowly. In the latter case the healthy (right) side was stronger during the stage of paralysis than after recovery (just the opposite of what occurs in organic hemiplegia). Tonic treatment and massage cured the patients. Féré draws a general conclusion from these cases and from some hypnotic experiments that exhaustion, or the idea of exhaustion, precedes the functional paralysis (or, in mental cases, the melancholic delirium), and that improved nutrition, or the idea of increased power, must precede recovery.

Post-Hemiplegic Ataxia, etc.—Many facts in connection with this subject will be found under the head of Cerebral Paralysis in Children. Demange¹⁸⁴_{Mar. 1} reports the case of a man, aged seventy-eight years, who experienced two slight attacks of hemiplegia, bilateral hemiparesis, followed later by well-marked ataxic movements during voluntary action in both arms and legs. Patellar reflex abolished and sensibility normal. The autopsy revealed symmetrically placed foci of softening in both lenticular nuclei and one in the left nucleus caudatus. No lesion of the internal capsules and no secondary degeneration could be found. Unfortunately, nothing is said of the state of the posterior columns of the spinal cord, and from what we know of the absence of symptoms of lesions of the lenticular nuclei we must hold this observation as of no value.

Knapp, of Boston,⁹⁹_{Nov. 22} describes some of these abnormal motor residua of cerebral paralysis in children, more especially the "mobile spasm" of Gowers. He refers to Greidenberg's scheme³⁶⁸₉₀ of those

symptoms, which we reproduce as useful for the study and classification of such symptoms by practitioners:—

Contractures,	{	Apoplectic,	{	Spasms,	{	Clonic, Tonic, Intermitting.		
								Muscular rigidity. Paralytic, passive, temporary. Constant, continuous, fixed, changeable (latent).
		{						
		Early,						
		Late,						
Increased tendon reflexes.								
Associated movements.								
Tremors,	{	Reflex clonus,	{	Tremor proper,	{			
								Essential,	In the form of paralysis agitans, In the form of disseminated sclerosis,

With reference to the mobile spasm, as described by Gowers, in my lectures at the College of Physicians and Surgeons, New York, I described and demonstrated it and all the intermediate disorders between tremor and true ataxia following paralysis in children, as far back as 1874.

Muscular Hypertonicity in Paralysis.—A. Hughes-Bennett^{47 Jan.} read a paper with this title, before the London Neurological Society, and an interesting discussion resulted, participated in by several well-known members. As a basis for his paper, the author described a symptom-group which appears to be “common” in England, consisting essentially in loss of voluntary power of one extremity, of both legs, or of all extremities, with exaggerated tendon and muscle-jerks. Sensory disturbances are usually absent, or if present are limited to subjective numbness; the quick evacuation of bladder and rectum observed in true lateral sclerosis are absent. Recovery is frequent, often taking place rapidly. The author proposes to call this “hypertonic paresis or paralysis;” he is disposed to consider it a functional affection. Other speakers were inclined to consider many of these cases as of hysterical or neurasthenic character. I have never seen a “functional” case deserving of separate classification as above, though I have observed remarkable examples of pseudospastic paralysis in hysterical and in neurasthenic patients, with many other symptoms of impaired nutrition of the nervous centres. Bennett brought forward the theories of increased muscle- and tendon- jerks in this connection, and reports the reflex view of the knee-jerk at once simply on the

strength of the time measurement of its production by Waller and others (which simply show it to be the quickest reflex action), and yet plunges without hesitation into the wholly contradictory statement "that increased response of muscle to percussion or to extensile stimulus is due to hypertonicity, and that the essential factor for its production is an exaggerated excitability of the ganglion cells of the cord" (p. 299); which, of course, would make the hypertonicity not an inherent muscular phenomenon, but a reflex one, only to be manifested when the chain or reflex arc was perfect (as is the case). Three other theories of the essential cause of increased tonicities (or of spastic states) are discussed: first, the theory of positive irritation in the fibres of the pyramidal tract (Charcot, Bouchard, and Brissaud); second, the inhibitory, or "let-go" theory, which assumes that increased spinal action (reflexes) is due to removal of a cerebral inhibitory influence (Jackson and others), and, third, a theory of active influence of cerebellar innervation (when the cerebral influence is removed) upon the spinal ganglia. The chief objection to the inhibitory cerebral theory is that increase of reflexes does not set in immediately after section of the cord high up or removal of motor zones. The author favors the French or active irritation theory. There was a general disposition to accept Bennett's proposition, except that Jackson formed the "let-go" or inhibitory theory, and Donkin rather satirically qualified the formula of "excitability" or "irritation of the anterior cornua" as "pedantic tautology." Ferrier prudently does not commit himself to any theory, though he states rather recklessly that the reflex character of the tendon reaction is now "generally abandoned." In connection with the new affection described, Jackson repeated his well-known views on the non-existence of strictly functional disorders; there is either shamming or a functional *lesion* in such cases. It is impossible to do justice to the point of interest in this debate, and it should be carefully studied. I was the first to propound the "let-go" theory of secondary contractures and spastic states,⁷⁵⁰ and see no good reason to abandon it. The chief objection to it is that the increase in the spinal activity does not take place immediately after the injury or lesion, but this is quite certainly due to the influence of shock, and, in experimental cases, hæmorrhage. In a frog, section of the cord high up is immediately followed by

absence of reflex movements in the hind legs, but a few minutes (usually) suffice to allow of their re-appearance, and they afterward increase beyond the normal. Bennett mentions (p. 305) with apparent surprise that in cases of hemiplegia from lesions of the cerebrum there is some increase of tendon-jerk on the healthy side. Several observers, Féré,⁴⁷ Pitres, and others, have observed loss of power on the healthy side in such cases. Both these phenomena are accounted for by the fact mentioned in the article referred to, that the direct pyramidal fasciculus must be taken into account (with its variable size) in the study of hemiplegia. As regards the reflex nature of the knee-jerk I hold the same conservative opinion, and believe that it is a reflex act, and is peculiar in being the quickest reflex action. The elaborate theories and discussions as to the idiomuscular nature of the knee-jerk are upset in the most peremptory manner by the occasional recurrence of cases in which a crossed or transferred knee-jerk is clearly obtained [Hamilton,³⁵⁵ v. 10, p. 393. Thue,³⁰⁹ July].

Pathological Intracranial Pressure.—Under this title Adamkiewicz, of Krakow,⁸⁴ Oct. 13, 20, relates a case of vertex tumor in a healthy man, aged twenty-five. The growth was on the top of the head, of oval shape, strongly pulsatile. Its anterior edge was a little back of the coronal suture, at thirteen centimetres from base of nose. Its antero-posterior measurement was fifteen centimetres, its breadth ten centimetres, and its greatest height nine centimetres. No cerebral symptoms were present, but as the patient was anxious to get rid of the tumor its removal was undertaken by Miculicz. At a first operation the growth was removed as far as the dura mater, the bone being found destroyed. At this stage Adamkiewicz performed what to us seems an unwarrantable experiment. He placed a pledget or compress in the aperture, and as the patient regained consciousness exerted increasing pressure on the brain. He found that even a pressure of seven kilometres produced no special symptoms. A few weeks later the second operation was done, and in attempting to remove the stump of the tumor it was found necessary to remove quite a piece of dura mater, and the longitudinal sinus was cut across. This produced severe venous hæmorrhage, which was arrested by means of a compress of iodoform gauze and a bandage. In half an hour, as the patient regained consciousness, he cried out, and showed

left-side clonic spasms of arm and leg only. The neck, face, and eyes were unaffected. The spasms recurred every four or five minutes, and lasted from two to three seconds. Death occurred in one hour. At the autopsy lesions were found at the top of the brain on both sides, involving an irregularly oval space eight by five centimetres, much more lesion on right side. The caudal



FIG. 10.—TUMOR OF THE VERTEX.
(*Wiener Medizinische Wochenschrift*.)

part of the diseased surface was rough, showing where the growth and the knife had injured the brain; the frontal part was smooth, and was evidently not the result of simple pressure acting before the operation, but of the tampon used to stop the bleeding. The author goes on to compare the phenomena in this case with his experimental results, showing that there are three different degrees or stages of cerebral or intracranial pressure (*vide* ANNUAL for

1888). This case is not a very creditable one to the surgeon, and Adamkiewicz's experiments, after the first operation, cannot be too strongly condemned.

Analysis of Cerebrospinal Fluid.—Durat gave to M. Schmitt fourteen cubic centimetres of cerebrospinal fluid removed from a sacral meningocele by aspiration, and the following analysis was made, ²²⁰_{June 29}: Specific gravity 1004, showing a trace of albumen; in each one thousand grammes there were 4.20 of organic matter (albuminoids, fats, etc.), and of volatile salts (muriate and bicarbonate of ammonia), 5.80 of fixed mineral salts (about five of sodium chloride); no cholesterin or glucose could be found.

Lesions of Cerebral Vessels—Hyaline Degeneration of Cerebral Blood-Vessels.—Holschewnikoff, ²⁰_{June} under the direction of von Recklinghausen, makes an interesting contribution to this subject. The patient had shown no cerebral symptoms during life, but at the autopsy a small tumor (papilloma) was found in one postfossa of the skull, compressing the cerebellum. Besides there were very numerous chalky nodules scattered throughout the cortex of the brain and in the cerebellum. After the action of dilute acid, these masses were seen to be hyaline. A minute histological study of all styles of this vascular degeneration gave the following results: The hyaline substance first appears as minute drops in the outer coat of capillaries and small veins, without change in the nuclei or cells or in the contained blood-corpuscles. The drops coalesce, enlarge, and ultimately constitute long masses, or moniliform deposits, along the affected blood-vessels. At this stage the cellular elements are invaded and destroyed, calcification may appear, the adjacent white or gray nervous matter suffers simple atrophy (granular degeneration of ganglion cells and changes in fibres), but no activity of the neuroglia exists. In the fully developed hyaline masses a concentric arrangement is present very suggestive of amyloid degeneration of vessels. The author thinks it probable that corpora amylacea may arise from this hyaline change. The mode of production of the first hyaline drops the author believes to have been, in his case, due to retarded venous circulation from the intracranial tumor (?), producing a morbid secretion from the endotheloid cells. In his case a genesis from active or inflammatory changes in all of the vascular walls or in elements of the nervous tissue would not be admitted. Interesting

microchemical reactions are noted, chief among which are that no amyloid reaction could be obtained, that the young (initial) drops of hyaline substance took a beautiful violet color by staining according to Weigert's method, and that the hyaline resisted solution by most agents. The author further suggests that hyaline and amyloid substances may be only different stages of the same degenerative process. Quite a full abstract of previous contributions to the subject is included in the paper.

Lesions of Ganglion Cells.—Friedmann³⁶⁸_{Bd. 19, H. 1} has made an exhaustive study of the inflammatory changes which occur in cerebral ganglion cells and axis cylinders. We borrow from Tuczek's abstract.⁵⁴_{June 15} The occurrence of ganglion cells with two nuclei is denied; large, round, doubly nucleated cells occur in the inflamed cortex, and have been mistaken for them. The earliest changes observed in ganglion cells consist in a loss of the tint of the cell-body; it becomes lighter and clearer; changes in the fine striation of the cell-substance; it becomes coarser and more like net-work. During this stage, which may extend to the third day of inflammation, which may be termed a period of "dissolution" (rejuvenation), the cell preserves its shape and processes. Alterations in form soon follow, the cells being transformed into large, round, granular elements, on which nucleus proliferation takes place, producing elements which also undergo degeneration. This process is not observed to take place in the large cells of the third layer of the cortex and those of the ventral spinal cornua. Homogeneous transformation of ganglion cells as a retrograde process, and the same process in the connective-tissue cells, is accompanied by proliferation. Active changes do not occur in cylinder axes. These changes were observed only after the most active irritations, producing very acute encephalitis; they were absent in the interstitial inflammatory action which follows injuries, and in the lesions of dementia paralytica.

Anfimow⁷⁵_{May 1} concludes that vacuolization or vacuole formation in cerebral and spinal ganglion cells is pathological. He draws this conclusion from the study of the cerebral nervous system of six dogs and three rabbits hardened in different fluid, after death by various means. He did not find a single vacuolated cell.

Intellectual (Scholar) Fatigue in Children.—Under this head there appear two papers¹⁸⁸_{May 13, 20} and a very interesting discussion.

Delmas claims that a symptom-group is thus caused in adolescents, consisting of occasional headache, flushing of the face, nervous crethism, prostration alternating with excitement, insomnia or disturbed sleep, disorders of nutrition ; later, constant headache, threatened meningitis, and mental symptoms. He attributes this condition to excessive mental exertion and relative or absolute absence of physical culture. Segay, on the other hand, calls attention to the fact that in most schools the majority of pupils do not exert themselves very much, and that intellectual strain, strictly speaking, falls on very few. Other causes of the symptoms described by Delmas he considers to be hygienic and moral ; more especially lascivious reading and sights and self-abuse, though he does not speak as plainly on the last cause as he evidently desires to do. My attention has been specially directed to this class of cases for several years. Segay believes that intellectual fatigue is an exceedingly rare cause of the "breaking down" of school and college pupils of both sexes. He has been led to consider the usual causes to be "eye-strain" (which seems to be ignored by the physicians of Bordeaux and other French writers on the same subject), insufficient food (especially lack of animal food), and a relatively enormous excess of starchy food, which is given to pupils in French and American schools (with very few exceptions), and last, but not least, masturbation. This is practiced to a frightful extent in schools, perhaps most in select private schools, and in my experience has been a rarely absent element. No instruction is given to boys and girls on the subject of sexual functions by teachers or parents, and many practice the vice without knowledge of its fatality. In one of his cases, a beautiful girl who developed epilepsy in a first-class private school for girls in Philadelphia, the patient, when asked about the practice, replied, without shame or consciousness of wrong, that she had done it, and that "all the girls did it." Christian,¹⁰ one of the most able of French alienists, has added his testimony against the frequency of excessive mental exertion as a cause of insanity. This was in contradiction to a statement made before the Academy in March, 1887, to the effect that a large number of students leave their schools (the higher or professional schools) with worn-out brains, and find themselves at thirty-five or forty incapable of intellectual effort. Christian further expressed the opinion that real effects of cerebral strain were more

marked (as regards insanity) in army officers who had risen from the ranks than in those who had passed through the government schools. I have been led to a similar conclusion with reference to cerebral neurasthenia and insanity; self-made men and women, especially those not inheriting a capacity for cerebral activity (children of uneducated parents), are much more liable to "break down" in this way. He has seen several remarkable examples of cerebral collapse between thirty and forty in such men and women. In an editorial on the same subject, as illustrated in London schools, ^{May 26} the author does not properly distinguish between the multifarious causes which operate on the pupils of these schools: faulty hygiene, insufficient food, inheritance of poor brains, tendency to cerebral disease, etc., in addition to the stuffing process which is termed a school curriculum.

Education of Backward Children.—This subject has been discussed in Germany, Norway, and England, in this country by an editorial writer. ⁶⁰ ^{July 21} It is a most important subject in sociology. Our schools are crowded with children who make but very little progress or none at all, and who are in reality partial idiots with defective brains, or imbeciles with brains enfeebled by disease, insufficient food, inherited limited capacity, or self-abuse. In Norway it is stated that 0.4 of all school-children belong to this class. The proportion in American public schools remains to be determined, but it must be considerable. The ordinary curriculum, which is absurdly based chiefly on memorizing, is, of course, wholly unfit to develop those children who need a modification of Seguin's physiological education for idiots under special teachers. Not only are these children unimproved in ordinary schools, but their presence retards the progress of the normal children and tends to demoralize them. It is to be hoped that, as suggested by the late Dr. Seguin, more medical advice and active intervention will be brought to bear upon our school system. It might be added that in many other particulars medical inspection and advice would be of great assistance to public education, in such matters as eye-strain, spinal strain from badly proportioned desks and seats, distribution of light, proportion of mental and physical culture, etc.

In the Psychological Section of the British Medical Association ² ^{Sept. 1} an interesting discussion took place, participated in by Warner, Shuttleworth, Hack Tuke, Yellowlees, and Beach, as to

what should be done with the slightly feeble-minded or imbecile or weak-brained children who are to be found in every school. It was the opinion of the physicians mentioned that auxiliary schools should be established for the benefit of such children who were neglected or abused in the general schools, and who exerted a bad influence on the progress of the class. It was stated that such auxiliary schools were in successful operation in Norway and Germany. The advisory intervention of physicians in schools was also advocated. These ideas were long ago advocated by the late Dr. Edward Seguin, who, besides suggesting that a physician should examine school-children as to their cerebral capacity and their tendencies to cerebral diseases, urged that the principle of physiological education be applied to the training of backward children. It would seem time that such a good work were begun in the United States, particularly in the large cities.

Muscular Atrophy from Cerebral Disease.—Quinke³²⁶ Ed. 42, H. 5 describes a case in which convulsions were followed by paresis of the left extremities (caused by a glioma of the right precentral gyrus). The muscles of the shoulder and upper arm were much wasted but did not exhibit the absolute paralysis and degeneration reactions characteristic of poliomyelitis. Spasms in the left arm and leg occurred occasionally till death. There were no histological changes in the cervical cord. The author concludes that the muscular atrophy must have depended upon the cerebral lesion.

Traumatic Defects in the Cranium of Infants.—Hench⁴ July 16 presents a history of two fatal cases of this condition in children of five and three months of age. There was a pseudomeningocele with edges of bony defect distinctly perceptible. From the autopsies the author concludes that after the accidental fracture hæmorrhage takes place and hinders the growth of the bone and the formation of any callus; the untorn membranes (in some cases the dura is torn by the accident) and cerebrospinal fluid prolapse, with in some cases prolapse of the brain-mass. The affection is clearly distinguished from craniotabes. In some injuries the brain itself is injured, and local encephalitis results.

Sclerema with Paralysis in Children.—Angel Money⁶ Oct. 27 observed three cases of this sort in one family, all female infants (congenital?). Besides sclerema there was paralysis of the limbs and of truncal muscles, with various contractures in one case and

flaccidity in another. In all the knee-jerks were absent, and strong faradic currents produced contractions only in facial muscles. In one case the brain and bulb, in another the cord, were found healthy to microscopic examination. There were no evidences of syphilis, though the history of the parents is not given. The author throws out the hint that infantile paralysis (what form?), sclerema, and myxœdema may be related.

Craniometry.—Peterson⁵⁹_{June 23} has presented an abstract of Benedikt's principles, and given a description of his instruments and methods which will doubtless stimulate the study of craniometry in our asylums and prisons. The instruments figured are not indispensable, and, as the author remarks, the most useful measurements may be made with a pair of callipers (graduated in millimetres) and a cirtometer, made of a strip of flexible lead. Luys, of Paris, has recently perfected a cirtometer constructed somewhat on the principle of the latter's configurator, which enables one to obtain tracings of shape and size at the same time. This, with callipers, would be a sufficient outfit for an institution. For those specially interested in the subject we would refer to the essays of Benedikt¹²¹¹ and Luys¹²¹²₁₈₈₆. Metz, of Sandusky, O.,¹⁰⁴¹_{June} has taken the shape of the head with a latter's measure or conformator in more than one hundred subjects. He reaches the usual conclusion that all heads are more or less asymmetric; that large heads predominate (does not give nationality of subjects); that the left side of the cranium is usually larger. He also confirms Landolt's observation that in persons with defective eyes the frontal region is quite usually deformed or asymmetrical. As stated above, Luys' instrument for craniometry serves the purpose of the conformator, besides being useful for more valuable measurements. Benedikt⁵⁷_{Oct. 7} read before the British Medical Association at Glasgow in August a brief paper in which he summarized the clinical bearings of his craniometric observations. He concludes that in the vast majority of cases abnormalities of the head and skull represent abnormalities (structural and functional) of the subjacent brain, and *vice versâ*. In many apparently negative cases (cases in which cranial defect exists without psychical symptoms) we must bear in mind that in many degenerates the symptoms do not manifest themselves until a relatively late period, and also that we are as yet only in the beginning of our knowledge of the semeiology of degeneration.

Definite cranial segments overlie definite cerebral areas, so that a study of defects must not only apply to general but to sectional or regional measurements. Imperfect development of one cranial region represents a corresponding aphasia of a brain-segment which cannot be compensated by excessive development in other directions. Leptocephaly (microcephaly) is observed most frequently in cases of congenital or early acquired spastic affections, epilepsy, hemiplegia, and paraplegia. It is often one-sided (asymmetry). Besides motor affections of varying degree, microcephalics are feeble-minded, and perhaps specially disposed to insanity and ethical perversion. Excessive reduction of the vertical parietal arc Benedikt finds especially in cases of idiopathic epilepsy, and it is also extremely frequent in forgers (?). Shortening of the vertical frontal arc is frequent in epileptics, and especially in those subject to psychic attacks. Trigonocephaly is frequently found in epileptics, insane, and suicides. Want of height of the skull is an especial sign of degeneration. Particular stress is laid on the value of lateral asymmetry, complete or partial. Among those morbid forms one-sided shortening of the auricular part of the sagittal axis is particularly significant of degeneration. Recession of the forehead is only of value when accompanied by a reduction of the frontal arc, and especially when the posterior segments of the brain are hindered in their growth. Benedikt considers the reduction in the size of certain important arcs as of more importance than a relative reduction of the whole cranial volume.

Encephalic Allochiria.—Under the misleading title of *acoustic allochiria* Gellé⁷³_{Jan. 21} reports a case in which, with deafness from middle ear, disease on the left side, a vascular bruit in the right carotid and right ear (audible to observer) was heard by the patient only on the left side or apparently in the left ear. There is no report of tuning-fork tests, and the case is probably one simply illustrating the law that when the middle ear is diseased (or aërial hearing cut off) bone conduction is increased. The sound in the patient's right ear was heard only on the left side because of increased bone conduction, and the sound of a tuning-fork placed on the teeth would certainly have been perceived in the same way, *i.e.*, only or chiefly on the deaf (left) side. To constitute a true acoustic allochiria the crossed hearing should be for externally produced sounds (by aërial conduction).

Visual Allochiria.—Magnin²⁴¹_{Feb.} reports a case in which in the hypnotized state this phenomenon was clearly marked. The patient detected colors with the left eye, and when the fields of vision were separated by a screen the colors were still distinguished by the left eye but referred to the right; *i.e.*, the patient thought she saw with the right retina objects which were held in front of the left. In the same subject there was common sensory allochiria (in the hypnotic state), a touch on the left arm was referred to the right, irritation of the left conjunctiva produced reflex movements of right eyelids. Féré⁷⁵¹_{Jan. 27} reports a motor allochiria obtained by paralyzing a muscle on the anæsthetic side of the face in a hysterical subject. The homonymous muscle on the opposite showed contraction as well as the one directly paralyzed. He suggests that in some cases of allochiria the patient is conscious of a diffuse (double) excitation, but owing to reduced sensibility of the part tested he is definitely conscious only of the sensation referred (from the central active state of sensory cells) only to the opposite and homologous part. Huber, of Zürich, ³⁴_{Aug. 2} observed well-marked though variable allochiria in the legs of a patient affected with disseminated cerebrospinal sclerosis (verified by autopsy). There was at the time a moderate degree of triple anæsthesia. The area in reference of sensation was variable, sometimes to other parts of the limb irritated, sometimes to the corresponding region of the opposite limb.

Causes of Rapid Increase of Nervous Diseases in Modern Times.—In a thoughtful though necessarily fragmentary lecture, Fletcher, of Indianapolis, ⁵⁶_{Feb.} draws a sketch of the causes of this increase, classifying them under four heads: (1) the religious or moral conditions of the people; (2) their education and occupation; (3) the accumulation of bad inheritances; (4) the modern cultivation of the disease (insanity), and the meagre means used to suppress it. Particularly suggestive are the author's remarks on the evil effect of state care and permission of marriage in cases of insanity, and the so-called philanthropy which has characterized Christian efforts at caring for the deformed, the blind, the lame, and the criminal, thus furthering the spread of these conditions by procreation. It seems very clear to me that no progress can be made in checking the increasing flood of degeneracy and crime (which usually go hand-in-hand) until apparently tyrannical laws,

pro bono publico, shall have been passed providing for the perpetual incarceration of large classes of unfortunates and for the prevention of their opportunities for procreation.

Hygiene of Reflex Action—Treatment.—Under this heading H. L. Taylor²⁴²_{Mar.} writes a thoughtful and suggestive article on the physiological education obtained naturally in human beings, and in some cases to be obtained therapeutically in certain cases of disease, or, more properly, of disordered reflex and automatic action. The second part of the paper is marred by its special pleading for the author's excellent treatment. He should have given us his unsuccessful cases too, and those would have proved instructive. Moral hygiene, separation from parents, imparting of confidence to subjects of self-delusion as to state of parts, improved nutrition by carefully regulated rest and passive movements, special muscular drills, are not new means of cure, but they are very intelligently and ingeniously applied by the author. Strangely, he seems to ignore the large part that *suggestion* plays in his method of treatment.

Perron⁷⁰_{Aug. 76} advises a method of counter-irritation which is applicable to the scalp and to the spinal region, viz.: a short, brisk friction with pure carbolic acid. Besides the local heat, redness, and later anæsthesia and brown, dry eschar, various distinct nervous symptoms are produced, showing a powerful nervous influence. Even vertigo, tinnitus, and pallor of the face were produced by a spinal application. The pain was moderate and no suppuration ensued. Remarkable improvement was observed in obscure cases of spinal disease.

A Kinesiæsthesiometer and the Muscular Sense.—Hitzig⁷⁵_{May 1, 18} describes a new apparatus for testing the sense of muscular effort, consisting of a set of seventeen loaded wooden balls, ranging in weight from fifty (one and three-quarters ounces) to one thousand grammes (thirty-five ounces). These are to be suspended by means of a pocket to the extended hand or foot. The results obtained show great differences, probably largely due to individual variations. In the upper extremity, above fifty grammes (one and three-quarter ounces), a difference of one-tenth, is clearly recognized. In the lower extremities the recognition is coarser, errors of ninety (two and two-thirds ounces) or one hundred grammes (three and one-quarter ounces) occurring, and no distinction being possible

between weights below ninety grammes (two and two-thirds ounces). Several pathological cases were tested. In one of cerebral paralysis weights were overestimated, while in one of peripheral paralysis they were underestimated. He concludes that the appreciation of weights depends upon centripetal impressions. He lays stress on sensations derived from the articular surfaces. No special practical result from these experiments is evident, for want of a fixed normal standard.

EPILEPSY.

Semiology and Diagnosis.—Hare, of Philadelphia, ⁹_{Nov. 17} reports two cases of *epilepsia procursiva*. In both cases the “running fits” were the only manifestations of the epilepsy, in one case no cause could be determined, in the second case an injury to the head with unconsciousness had occurred a year previous to last attacks. Pohl ⁸⁸_{Aug. 29} calls attention to the most infrequent co-existence of original paranoëa with epilepsy, and reports two cases. In both the epilepsy seemed “idiopathic,” and the patient showed cranial asymmetry. In both cases delusions of persecution were prominent, in one connected with an imaginary extra conjugal maternity, in the other with hallucinations of all the senses. These psychic manifestations were not post-epileptic disorders, but constant conditions. Gerstacker ²⁹⁵_{Bl. 45, II. 4} relates at length a case of psychic epilepsy in a congenitally feeble-minded soldier of the German army, which is chiefly remarkable as exhibiting the disciplinary indifference or ignorance of the medical officers who were concerned in the patient’s long course of automatic ill-doing. In France, England, or even in the United States the man would have been safely incarcerated in an asylum at an early period of his career. Féré ⁴⁵²_{May, June} has studied pulse-tracings taken during epileptic paroxysms. He found that immediately after the spasm the pulse-curve was dicrotic or polycrotic, with rounding of the apex, or even with a flattened apex. Experiments made on healthy subjects showed that after violent muscular efforts of the arms the same modifications of the pulse-curve were present. This would tend to show that modifications of the curve were due simply to muscular effort, and that sphygmographic study would prove of no assistance in distinguishing between true and false (imitated) epileptic spasms. Finlay ²¹³_{Sept.} contributes an elaborate paper on some points in the symptomatology of epilepsy and of epileptic

insanity. The paper is well worth reading, though it contains nothing new. The most interesting point is that concerning the urinology of the disease. Out of thirty-one patients, twenty-one presented albuminuria at different times, glycosuria was extremely rare, the average daily quantity small, and the specific gravity low; urea and phosphates were very deficient. In some cases on days when fits occurred there was a relative increase of urea and alkaline phosphates. Bourneville and Sollier⁷³_{Sept. 25} call attention to the extreme frequency of fronto-facial asymmetry in cases of idiopathic epilepsy; out of thirty cases only one did not show irregularity of outlines of face and head. They consequently bear out Lasègue's law (1877) as to the frequency or constancy of this symptom. But Lasègue by no means meant to say that all subjects with cranio-frontal asymmetry were epileptics. Bourneville and Sollier found that this asymmetry exists in young epileptic children, thus overthrowing Lasègue's theory that it was due to imperfection in final ossification (tenth to twentieth year). These researches are more fully expounded in Pison's thesis, Paris. Springthorpe²⁸⁵_{Nov. 15} analyses the symptoms, etiology, etc., of fifty cases of the disease, results tabulated, and of some value to the special student. Pitres⁹²_{Aug.} writes an interesting paper on some equivalents of Jacksonian or partial epilepsy. He cites examples of sensory, special sensory (hallucinations) and psychic attacks occurring in the course of ordinary or of Jacksonian epilepsy. He also adds a number of cases in which transitory monoplegia or hemiplegia, with or without aphasia, occurred, and considers these as belonging to the same category. The cases related and cited are most interesting. The author does not appear to have had experience in the lesser psychic disturbances which sometimes replace epileptic seizures, more especially the dream-like state and automatism. It is also a serious question whether hemi- or mono-plegic seizures occurring in non-epileptic subjects should be classed as epileptic equivalents; we must draw the line somewhere. J. Hughlings-Jackson⁴⁷_{July} publishes the first part of a characteristic but extremely interesting paper on a "peculiar variety" of epilepsy, called by preceding writers "intellectual aura." Jackson refers to the dream-like state, state of recollection, or of reminiscence, or of sudden interruption of normal thought by the intrusion of a peculiar, half-conscious train of thought with hallucinations, which experienced observers

of epilepsy will at once recognize as having occurred in a few cases in their practice. The condition may precede or replace an ordinary attack, or may occur alone for months or years as an independent variety of petit mal. Jackson very properly insists on the desirability of distinguishing this complex and higher state from ordinary aura, even those of special senses. These may co-exist with the dreamy state. These seizures may occur without objective signs except an arrest of speech or an appearance of absentmindedness.

I have long recognized this variety of petit mal, and intended writing upon it. As far back as the year 1877 I noted these seizures in a very intelligent young lady, who described this dreamy state as combined with vertigo, and called it, "pretendy [pretending] turns." The day this abstract was penned another example of this petit mal (both independent and as precursor of an attack) was examined in my office. I have seen quite a number of cases in the intervening eleven years. The condition seems to resemble incomplete normal sleep, and in support of this explanation I would state that frequently when writing or reading very late at night, when tired, I have half lost consciousness and had a momentary dream with pseudo-hallucination, sometimes finding scratches on my paper in place of distinct writing, as a tell-tale of the temporary suspension of normal continuous cerebral activity. Consequently, for me the dream-like state is not necessarily a pathological petit mal in all cases, and I would add my opinion that it forms (in pathological states) a transition to a degree of what is known as automatic somnambulism. The cases related by Jackson are very striking, and the paper should be carefully studied by those interested in epilepsy and psychiatry. Berbez¹⁰⁹_{No. 28} writes a fairly good summary of the literature of Jacksonian epilepsy. The same author¹⁵²_{Jan. 3} reports an interesting case (verified by Charcot) of epilepsy in a boy preceded by an intestinal or, more properly speaking, rectal aura. A bromic treatment controlled the disease.

Slow Pulse and Epileptiform Convulsions.—Sigg, in a review of Grob's Zürich thesis on bradycardia,²¹⁴_{Jan. 15} relates a case of his own. A man, aged sixty-nine, alcoholic, had epileptiform seizures during the summer of 1887. He presented signs of extensive arteriosclerosis, debility, and generally impaired nutrition; pulse, sixty to the minute. Under chalybeates and bromides the attacks

ceased for three months, but reappeared, recurring with extreme frequency, every few minutes, until his death in March.

From the beginning of February the pulse-rate varied from twenty-four to twenty-one per minute, with intervals at times of from five to fifteen seconds. In many of the attacks the pulse was only nine per minute, with indistinct tumultuous heart-sounds and a faint systolic murmur. The slighter epileptiform attacks consisted of redness of the face, clonic spasm of the facial muscles. The severer ones presented pallor of the face, upward or nystagmic ocular movements, spasm of facial muscles, and occasionally jerking of the limbs. The autopsy showed fatty heart and atheroma of many arteries, including the left coronary. Unfortunately, there is no account of the state of the medulla oblongata. In these cases it is almost always a question whether disease at the roots and irritation at the vagus are not the essential primary factors of the symptom-group.

Pathology and Etiology.—Seppilli⁵⁹¹_{v.13,p.274} calls attention to the fact that so-called Jacksonian attacks may occur in cases of diffused bilateral cortical lesions, and relates four cases in which autopsy revealed a diffused meningitis over both hemispheres without true coarse focal lesions of the cortex. The same observation has been made in acute meningitis, where hemiplegia, or even monoplegia, may occur without our being able to demonstrate focal lesions. I do not believe that these cases invalidate Jackson's law in the least, for in such cases slight, or even microscopic, lesions of the cortex may preponderate in one or another motor centre, and not be revealed by any ordinary autopsy. E. D. Fisher²¹²_{Sept.} read before the American Neurological Association an interesting paper on cases of epilepsy following infantile cerebral hemiplegia.

The clinical aspects of this frequent condition are well pointed out. I would go still further and suggest from my experience that in a certain number of cases of so-called idiopathic epilepsy dating from childhood, a careful examination of the patient will reveal evidences of a very slight, "cured," infantile hemiplegia, viz.: asymmetric cranium and face, slight difference in size of limbs on the two sides (sometimes a short leg and consequent scoliosis), left-handedness, and mental backwardness. Bourneville and Bricon close their long *mémoire* on procursive epilepsy (*vide* ANNUAL for

1888) by a study of the lesions observed in two cases of their own and in one case by Meschede.⁹⁴ They conclude that while these autopsies are faulty because they reveal multiple lesions, yet they are valuable as tending to prove that procursive movements are dependent upon lesion of the cerebellum. In support of this *post-mortem* induction they refer to Weir Mitchell's experiments, in which freezing of the cerebellum in pigeons caused movements forward, followed by retrograde movements. From these statements it would seem that Bourneville is of the opinion that in procursive epilepsy there always exists, in addition to other lesions, a lesion of the cerebellum.

That epileptic attacks may be produced by syphilis in its "secondary" stage is shown in a paper by Fournier.¹⁰⁰ He relates three cases: one in which a latent infantile epilepsy was revived by syphilis (six seizures in ten years preceding infection, and eleven seizures in four months during the exanthematous period of syphilis); a second and third case in which true general epileptic spasms occurred for the first time during the second stage of syphilis. Mercurial treatment successful in all. Thus, he claims, syphilis may revive an old epileptic tendency or actually cause attacks. He distinguishes between these seizures and the more or less Jacksonian attacks of the later stages of syphilis.

In regard to reflex epilepsy, Dirmoser⁵⁷ relates the following case: A boy at nine years of age fractured his right clavicle, and union did not take place. Nine months after aura-like symptoms occurred in the right arm, and later typical epileptic seizures. These occurred spontaneously, or could be produced by pressing the acromial end of the clavicle against the brachial plexus. When nineteen years old he had epileptic attacks occurring from three to five times a day. In August, 1887, the usual operation for reuniting the fragments was successfully performed; the attacks diminished and ceased entirely, none occurring from December 11, 1887, to the time of patient's death from phthisis in August, 1888. In connection with this interesting case it should be noted that Brown-Séquard, in his beautiful experiments on the production of epilepsy by nerve lesion in guinea-pigs, was never able to produce the disease by lesion of the brachial plexus, whereas, after injury to the sciatic nerve, epilepsy almost always followed.

Pins⁵⁷_{May 12} relates a case of middle-ear disease in a hysterical young woman, in whom, immediately after the removal of a polypus, a really epileptic seizure occurred. He refers to similar cases of Boucheron, Moos, Schwartz and Köppe, Wilde, and others. An epileptic attack due to irritation of the acoustic nerve is characterized by suddenly developed tinnitus, vertigo, vomiting, and deafness, followed by the ordinary epileptic phenomena. It is a variety of reflex epilepsy. It must be very difficult in many cases to distinguish between such an attack and one of severe Ménière vertigo, and between epilepsy with acoustic aura. It would be better to designate such attacks as aural eclampsia. De Mendoza¹³⁶_{Aug} reports a much better case which is really deserving of the name of aural epilepsy. A man, aged twenty-eight, had suffered for eight years from typical grand mal which had resisted treatment. He consulted Dr. Mendoza for an enormous polypus of the left ear, which, to the patient's knowledge, had existed for six years. There was a history of otitis purulenta simulating meningitis eleven years before, *i.e.*, three years before the first fit. Manipulation of the polypus twice caused convulsive attacks with complete loss of consciousness and biting of tongue. Removal of the polypus cured the patient; at least, no attacks had occurred when seen five months later.

Lemaire⁹²_{Oct. 10} reports the case of an adult given to alcoholic excess for twenty-five years, who with each of two attacks of pneumonia had an epileptic seizure. He refers to Renaud and Lépine's paper on pleuritic epilepsy. Here again the term eclampsia would be far more appropriate. The author does not state condition of kidneys, and does not even discuss the very probable renal origin of the attacks. Lemoine⁷³_{Apr. 21} argues, strangely, in favor of a constant acquired local nervous lesion as the efficient cause of so-called idiopathic epilepsy. He allows a secondary part to hereditary neurotic predisposition, and is inclined to deny the inheritance of epilepsy. He claims that in many so-called idiopathic cases a history of an acute infectious disease is obtained, and that in the course of such disease microbic infection of the brain and cord occurs, forming inflammatory foci, which undergo complete absorption or cicatrization. The cicatrices (in syphilitic and traumatic cases also) are the immediate sources of epileptic attacks. He states that infantile paralysis (he must mean the

cerebral form) is a frequent factor in epilepsy. These views are in accord with and in support of ideas previously expressed by Marie, ⁷³_{p.233/87} by Pierrot, ²¹¹_{Nov.17/87} and by Ballet and Dutil, ⁹²_{p.38/84}. In opposition to this view may be cited the statistical results obtained by Bombart ¹⁸⁸_{June 17} by the study of one hundred and ten epileptic families. He found that epilepsy was the most frequent form of direct heredity; next to it was mental disturbance with the well-known signs of degeneracy. Brubaker ²¹²_{Feb.} writes an elaborate article, in which more than fifteen cases are related or cited, to show that irritation of the dental nerves by diseased or misplaced teeth may be a cause of epilepsy. This suggestion must take rank with others in which the importance of other peripheral irritations (nasal, ocular, gastric, sexual, etc.) have been advanced as efficient causes of epilepsy. It is possible that such cases may and do occur, but they are extremely rare, and the central theory of epilepsy remains as the one by which our researches and therapeutics must almost always be guided. Wilks, ⁶_{Aug.11} in a short but valuable article, discusses the question of the relationship of migraine and epilepsy. While recognizing that the two affections resemble one another in being paroxysmal, he denies their pathological association. Out of his vast experience he only recalls one case in which the two affections co-existed, and he has never known one disease to pass or develop into the other. He states that epileptics are remarkably exempt from headache, and that remedies do not act alike on the two diseases, *e.g.*, antipyrin and bromides. This strikes me as a very valuable suggestion. On purely theoretical grounds, following out Jackson's principles of "discharges," it would seem as if epilepsy and migraine were very closely related, but in practice it is certainly not so.

Experimental Pathology.—Ziehen ⁶⁹_{July 19} experimented on rabbits whose hemispheres had been removed. Mechanical and faradic excitation of the clonus, nucleus caudatus, and nucleus lenticularis produced tonic spasm of muscles on the opposite side (face, neck, and limbs). If the excitation was prolonged general tonic spasm ensued. An extremely severe, protracted titanic spasm, caused by irritation of the posterior corpus quadrigeminus, gave rise to violent running movements of the animal, cut short by faradic excitation. François-Frank ³_{Aug.6} sums up results of extensive researches on effects of epileptogenous excitation of the cortex

upon the vascular system. He finds that in a fully developed, artificial, cortical epileptic attack, during the stage of tonic convulsion, the cardiac action is slower and the arterial tension greater, while in the clonic period the heart acts more rapidly. He considers these cardio-vascular phenomena to be due directly to the irritation of the cortex cerebri and only of the motor cortex. Binswanger⁷⁵_{May 1} makes a brief report of his experiments on the production of epilepsy (?) by excitation of the floor of the fourth ventricle and the cut surface of the pons in rabbits. Electrical and mechanical irritations applied to these parts gave rise to tetanic spasms and also to a variety of co-ordinated movements, but no truly epileptic seizures were observed, *i.e.*, a succession of tonic and clonic spasms surviving the irritation.

Treatment—Féré²_{May 19} has tried counter-irritation to the scalp in ten cases of post-hemiplegic epilepsy (adults). The actual cautery was applied in streaks, so as not to produce suppuration over the motor centres. The only result noted was a reduction in the number of attacks in eight cases. Campbell Black²²_{Oct. 24} highly recommends the use of monobromate of camphor in doses of three to ten grains (0.2 to 0.65 gramme), *ter die*, with belladonna. He claims to have used this drug with satisfactory results since 1871. A new remedy for epilepsy is tincture of *simulo*, the fruit of *capparis coriassca*. It has the indorsement of White⁸⁰_{May 15} and of Eulenburg.¹¹⁶_{Aug} In doses of from one-half to two teaspoonfuls three times a day this preparation seemed to exert a controlling influence on the disease, without any harmful effects. The authors are not, however, very enthusiastic in its praise. Signicelli¹⁹_{Sept. 22} has tried transverse galvanization of the thyroid gland in seven cases, using a current of from one to five milliampères by large electrodes (four inches square). In three cases no result; in four cases, first an increase, then a steady decrease, in severity of attacks; intermission of one month in one case and of two months in another was noted. This procedure was in reality a galvanization of the sympathetic and pneumogastric nerves, and the results obtained were practically *nil*.

Cripps¹⁸⁷_{July} states that epileptic coma is due to diminished or suspended oxidation of the brain-substance, and suggests the use of inhalations of oxygen in this condition, or in some cases, after a first fit, to prevent others. This method has been successfully

used by Fehrnikin in 1885 in a case of puerperal eclampsia. Finlay²¹³_{Sept.} studied the effects of remedies in thirty-one cases of epilepsy with insanity. The bromides proved to be the most efficient agents in controlling attacks. Antimony, aconite, zinc sulphate, arsenic (alone) yielded no good results. Some reduction in number of fits was obtained from the use of borax in doses of from fifteen to thirty grains (one to two grammes) *ter die*. As regards chloral, in five cases it did no good and produced stupor. This last result is a good illustration of Trousseau's dictum that success in therapeutics does not lie so much in the drug used as in the manner of its administration. Chloral properly dosed, usually with bromide, has proved in our hands a most valuable and reliable antiepileptic remedy, *not* producing stupor. Antipyrin has been further tried as a remedy against epilepsy by Fraty, of Lyons,⁸⁹_{May 15}. The drug was used in eighteen cases; in one case the attacks were suppressed during treatment but recurred on its cessation, in seven cases a marked reduction in attacks was obtained, in five cases disagreeable symptoms necessitated the withholding of the medicine, in two cases nausea was produced, in three cases no effect was obtained. Doses used were from forty to sixty grains (2.59 to 4 grammes) *per diem*. Altogether the experiment was unsatisfactory. Borosnyoi¹⁶⁹_{Mar.} tried antipyrin in nine cases of epilepsy in the insane asylum of Hermannstadt with no satisfactory result. Its continued use produced cyanosis in every case. Crozes, of Algiers, has obtained (as many others before him) an amelioration, and in some cases a cure(?), by the application of blisters (circular usually) in cases of Jacksonian epilepsy, applied just above the seat of the aura. From what we now know of the pathology of Jacksonian epilepsy this means that the use of constricting bracelets must be looked upon as *mere checks to each attack*, and not as a *treatment*. Schweder¹²¹⁴ reports trial of hyperosmic acid, given in pills containing 0.005 gramme (one-twelfth grain) twice and thrice a day, in eight cases. No cure was obtained; in two cases improvement was noted; in the remaining six cases no result. He cites the experience of Newsky⁷⁵_{Nov. 17, 88}, and of Wildermuth, who together treated twenty-five cases with doses of 0.001 gramme (one-sixtieth grain) *ter die*; one case was reported "cured," six cases improved, and thirteen cases were unimproved. From the

extremely volatile nature of hyperosmic acid, I am led to doubt whether these patients imbibed any of the drug; it would seem impossible to make it in pill-form, and even during its administration in solution much of the dose would be lost. After the reading of a paper by Robertson on the treatment of epilepsy, an interesting discussion occurred in the Medico-Chirurgical Society of Glasgow²¹³ on its surgical treatment, in which Macewen expressed his strong belief in the really corrective value of the removal of any peripheral surgical conditions causing the attacks; but Robertson replied that he had never seen a case cured by removal of a peripheral cause. Nothing new was said about bromides, amyl, and other medicinal agents. Bruns²¹⁴_{Mar.1} advocates the use of cold douches (one or two a day, each of one-half to one minute in duration), together with the systematic bromide treatment. He considers the mixed bromides as more effectual than any single bromide. He had tried cerebral galvanization, in various ways, on six cases without noteworthy result. Niermeijer⁶⁹_{Oct.4} has obtained surprising results by galvanization of the cranium over the motor gyri in three cases of epilepsy (two traumatic). It is true that bromide, five grammes (seventy-five grains) a day was given at the same time, but the patients had previously taken the drug in large doses with little effect. The cathode was placed in one hand and the anode applied labile-stabile over various parts of the head, mostly over the central gyri, with an electrode eighteen by twenty-five millimetres square; strength of current four by eight millimetres A. The length of application or its frequency (probably daily) is not stated; length of treatment, seven weeks to ten months. As remarked in the ANNUAL for last year (vol. i, pp. 105-6), this treatment is only available for a few charity cases. Very few private patients will submit to so long and costly (if done as it should be, by an expert) a treatment. The prognosis as regards life is treated of from the insane asylum physician's point of view by Worcester⁵⁹_{Apr.28}. In his own asylum (at Kalamazoo, Mich.), in twenty-eight years two hundred and thirty-four epileptics had been admitted, and of these 26.5 per cent. died, a much larger ratio than obtains for the insane. In a large table made up from fifteen American asylums, out of two thousand and seventy-nine epileptics, six hundred and eleven died, or over 30 per cent. In his own asylum only 15.4 per cent. of cases reached the

age of forty-five years. In this asylum, also, it is interesting to note that nineteen of the deaths, or over 30 per cent., died of single convulsions or of a small number separated by a considerable interval; seventeen cases, or less than 30 per cent., died in *status epilepticus*. Stevens, of New York, has published a formal essay and some shorter contributions on the cure of epilepsy and other neuroses by removal of eye-strain (tenotomy, prisms, etc.), but as I am a member of a committee of the New York Neurological Society for the study of this question, in co-operation with Dr. Stevens, I am debarred from criticising the material before next year.

HYSTERO-EPILEPSY.

Semciology and Diagnosis.—Under the title of “Hystero-epilepsy in a Man.” Pollak⁶⁸_{Jan.1} relates a case of hysteria interesting in many respects. Male, aged twenty-seven years, of Jewish race, absolutely without hereditary taint, began to have his attacks at twenty-two years. These consisted in a dreadful sensation and pain in the left hypochondrium, dizziness, singing in the ears, flushing of face, staring glance, gnashing of teeth, spasms of left extremities, followed by spasm, apparent loss of consciousness, various arciform movements (emprosthotonus and opisthotonos), profuse sweating. Zones of production and of arrest were found in the left hypochondrium, near the inner angle of left scapula over the fifth and sixth ribs, and on the exit point of right infraorbitalis nerve. In the intervals there was found left hemianæsthesia, including (partially) hearing, sight, and smell. The patient could not be hypnotized, but was sensitive to the tuning-fork, which produced attacks. Pressure on the hysterogenic zones had a less therapeutic effect than ether spray or faradization. A point of great interest is that the resistance to the galvanic current was from 0.5 to 1.5 millimetres A., less on the left side of the body.

Pathology and Etiology.—Potain¹⁷⁷_{July.91} reports a case of hystero-epilepsy (spasms, hemianæsthesia, achromatopsia, amblyopia, attacks ending with tears) in a male subject who had had syphilis and presented a cranial exostosis. He had been hysterical from childhood, was an inebriate, and his relatives were nervous.

Treatment.—Dodge¹⁹_{Apr.3} reports two cases of “cure” of severe hystero-epilepsy associated with dysmenorrhœa by chloride of gold and sodium in doses of one-twentieth grain (0.00324 gramme)

three times a day for several weeks. The second case was "cured" after using the drug for only two weeks (?), but, as the report is made only some three or four months later, some uncertainty remains as to real result. Sielski¹²_{Mar.} reports a case cured by bimanual reposition of a retroflected uterus and the insertion of a Hodge' pessary. At time of report the patient had had no attack in three years. Hirschfeld⁵⁷_{Sept. 23} reports case of girl, aged twelve years, who for one year had had severe hystero-epileptic seizures very much resembling epilepsy, and who was cured by a single *séance* of hypnotism (induced by pressure of fingers on closed eyes) with suggestion of relief. Hiron, of New York,⁵³_{Oct. 29} obtained great temporary relief in an aggravated case from the use of twenty-grain doses of antipyrin *ter die*. Bromides had (as usual) proved of no service.

E. C. S.

DISEASES OF THE SPINAL CORD.

TUMORS OF THE SPINAL CORD.

Gliomata and Syringomyelia.—The formation of cavities in the cord, or syringomyelia, is so intimately connected with the growth of gliomata in which the cavities appear to originate that they should be considered together. F. Schultze, Dorpat,¹¹⁴_{Bd. 8, H. 6} in an extensive article on this subject, illustrated by the analysis of seven cases, says, concerning the diagnosis of syringomyelia, that in many cases there are certainly no characteristic symptoms, but in the majority the excavation in the cord invades the cervical and dorsal levels, involving chiefly the posterior but usually also the anterior gray matter, the symptoms produced differing from those of other affections, as no other disease of the cord involves just those portions in this gradual manner. Owing to the slowly progressive destruction of the anterior horns, progressive muscular atrophy follows in the upper extremities, most frequently affecting the small muscles of the hand, while destruction of the posterior gray matter effects sensory disturbances of a peculiar kind, consisting in impairment of sensibility to pain and thermal impressions to a variable degree and extent, while tactile sensibility and the muscular sense remain normal, or but slightly impaired. In addition there are, in many cases, trophic disturbances of the skin or deeper parts, and anomalies of vasomotor innervation and of the secretion of sweat. The progressive muscular atrophy in the

upper extremities and shoulders, together with the partial sensory disturbances, constitute the cardinal symptoms which make a diagnosis possible; but they are not all to be found at every stage of the disease. On the other hand, as the process advances, the posterior and lateral columns may become involved, or the disease extend to the medulla, producing symptoms which vary according to the location of the lesion. Most important, particularly at an early stage of the affection, are the disturbances of the temperature sense and the existence of analgesic areas, also the slow advance of the disease.

M. A. Starr, of New York,⁵_{May} has reported a case still under observation in which he made a diagnosis of syringomyelia. In his paper he reviews the clinical features of the disease as presented by former observers, and the pathological findings in forty-eight published cases. He has conveniently tabulated, upon a diagram representing a transverse section of the cord, the extent and location of the lesion, by dividing the entire area into small squares and placing the number of the case in every square affected in the case. The concentration of the numbers in the squares about the central area of the cord shows the great frequency with which this region is involved. In half the cases, the anterior horns were invaded and paralysis with atrophy was present. In two-thirds of the cases, the posterior horns were involved and the characteristic sensory disturbances were present (loss of the pain and temperature sense with preservation of sensation for touch, pressure, and location). The diagram shows that the lesions are confined chiefly to the gray matter, and, to a less extent, to the posterior columns. The lateral tracts were involved in three cases only, the anterior columns not at all. The ages of the patients ranged from twenty-five to forty-five years.

Wladimir Roth, of Moscow,⁹⁴_{Nov.} has observed ten cases in which he made the diagnosis of gliomatous syringomyelia. The report is accompanied by a thorough analysis of symptomatology and pathology of this affection. Using the term syringomyelia in its restricted sense, indicating the formation of a cavity in the cord, he recognizes four groups or varieties, namely: (1) congenital hydromyelia, or dilatation of the central canal, or of that part of it which is detached during the embryonic period; (2) tumors formed from proliferation of embryonic epithelial cells of the

central canal which remain imprisoned in the posterior columns; their central parts sometimes degenerate, forming cavities; (3) the ependyma of the central canal may proliferate, forming a more or less limited solid tumor around the canal; (4) a diffuse hyperplasia of the neuroglia which penetrates between the neural elements and may or may not form cavities by degeneration of its substance. This is the class to which he refers his cases. He prefers the name "gliomatosis." This growth involves not only the ependyma, but also the gelatinous substance of Rolando, even invading homologous parts in the medulla, namely: that which gives origin to the ascending root of the trigeminus. The process is usually limited to the gray matter, but may extend to the white columns in rare cases, or, at a late stage, as secondary results. In the analysis of symptoms he makes four subdivisions: (1) analgesia and thermal anaesthesia; (2) subjective sensory disturbances, painful and perverted thermal sensations; (3) defects of motility, paresis, limited to the region most involved, convulsive action of certain muscles; (4) trophic and vasomotor disturbances, muscular atrophy, cutaneous, subcutaneous, and osseous dystrophies. The first two groups deserve a more detailed description, as Roth lays great stress upon the sensory disturbances, particularly thermal anaesthesia, which he found in all his cases, while tactile anaesthesia was absent. In seven cases the therm-anaesthesia was accompanied by analgesia. In two of these the analgesic and therm-anaesthetic areas were equal in extent, in the others its coincidence was imperfect; certain regions were inganalgesic, others therm-anaesthetic, but in general the therm-anaesthesia occupied a greater extent than the analgesia. At an early stage thermal anaesthesia may be limited to a very small space, as, for example, the hand. On the contrary, at a certain period the entire body may be involved. The distribution is nearly always asymmetrical, by regions or zones; for example, the hand and the upper part of the arm are frequently affected. It is not limited to the distribution of definite nerves, but to certain parts or divisions of a member. The upper extremities are involved most frequently, and usually one alone, the adjacent thoracic region being also involved up to the median line. The lower extremity may become involved, also the trigeminal area. When the distribution is bilateral, the two sides are not usually involved symmetrically. The degree of therm-anaesthesia varies greatly, not only from time to

time but in different areas. Total loss of thermal sensibility is rare. The difference between ice- and hot- water is usually appreciated. Differences will sometimes take place within a few minutes, as if a sort of "irritable weakness" were present, at one moment a difference of two or three degrees being appreciated, a few minutes later a difference of twenty degrees not being detected. The analgesia is equally asymmetrical and irregular in its distribution and variable in degree. It appears later than the therm-anæsthesia in some cases. One side of the body may be therm-anæsthetic, the other analgesic, or other irregular limitations may occur. Slowness of conduction to painful impressions has been observed but rarely. When tactile disturbances are present, which is seldom the case, and then in advanced stages of the disease, they also exhibit asymmetry of distribution. The muscular sense is usually preserved. The subjective phenomena are usually sensations of cold, heat, formication, and pressure; pain, usually dull, in the muscles, joints, or spinal column, or neuralgic pain in the extremities. The patients are prone to become despondent or hypochondriacal. Roth suggests that the reason why the pain and temperature sense are impaired and tactile sensibility preserved may be that the latter will not be affected by a degree of pressure or nutritive disturbance in conducting fibres, which impairs other kinds of function, and, therefore, it may not be so much a question of the tracts involved as degree of impairment.

Kohler, ⁶⁹May 24 of Prague, reports a case and reviews the questions of diagnosis of syringomyelia. His views are in conformity with those already given.

Silcock, London, ²Jan. 7 has reported a case as syringomyelia supposed to have developed from crushing and dislocation of the fifth cervical vertebra, compressing the cord. "There was a slit-shaped cavity inside and parallel to the right posterior root corresponding to the second cervical vertebra, and general sclerosis of the cord." The cavity was formed in sclerotic tissue, by a secondary process, he thinks. I look upon this case not as one of true gliomatous syringomyelia, but of simple inflammatory softening and excavation, the result of compression myelitis. The walls of the cavity are described as ragged; in gliomatous and embryonic syringomyelia they are usually smooth.

R. Volkmann ³²⁶pt. 42, II. 6 reports a case of glioma of the cord of rapid

growth, located in the dorsal region, mostly unilateral (right), and giving rise to anaesthesia (pain on pressure, temperature less to touch) of the left side below the lesion, with preservation of motility and muscular sense and of the superficial and deep reflexes; on the right, loss of motion below the lesion, hyperalgesia, absence of the knee-jerk, exaggeration of plantar reflex; later, loss of motion on the left side also, analgesia replaced by hyperalgesia, absence of hyperalgesic or analgesic zones above the lesion. The author also discusses the histology of secondary degenerations of the cord.

Glioma of Medulla Oblongata.—Sokoloff^{326 90} reports two cases of glioma,—one of the medulla and one of the pons. He has also collected in literature seven other cases of gliomata of the medulla and nineteen of the pons. The first case proved to

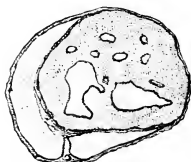


FIG. 1.—SECTION THROUGH THE TUMOR BELOW LEVEL OF CALAMUS. NATURAL SIZE.

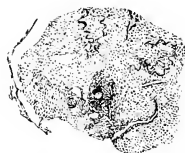


FIG. 2.—SECTION THROUGH THE OLIVARY BODIES AND UPPERMOST PORTION OF THE TUMOR.

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be a psanamo-glioma containing small cysts and minute cleft-like cavities. It occurred in a boy, four years of age. All but one of the tumors of the medulla were circumscribed growths, while twelve of the twenty tumors of the pons were diffuse infiltrating growths. Since this publication, Wm. Osler, Philadelphia,^{242 Mar.} has reported very carefully a case of glioma of the medulla, a cut of which is herewith reproduced.

Hydatids.—R. Maguire, of London,^{47 Jan.} has collected (mostly from the older authorities) two cases of cysticerci and twenty cases of hydatids in the spinal canal, including an observation of his own in which softening of the cord existed at the level where the cysts were found (upper six dorsal vertebrae). The symptoms of the affection are those of paraplegia from compression. In only four cases had the hydatids developed inside the dura. The cysticerci, however, were found within the cord.

Angiosarcoma of Pia.—E. Cramer, of Marburg, ⁷⁵_{Aug. 5} reports a case of multiple angiosarcoma (pons medulla and cauda equina) with hyaline degeneration.

MYELITIS.

Tatham ²_{Nov. 24} reports a case of recovery, after fourteen months, from complete paralysis and loss of sensation below the neck, after forcible flexion of the neck from a fall during "a fit." There were thickening and irregularity about the third cervical vertebra. Clutton and Makins ⁶_{Nov. 17} report two cases of injury to the cervical region followed by brachial paraplegia and recovery.

Under the title "Spinal Manifestations of Bleorrhœa," Hayem and Parmentier ⁹²_{V. 8, No. 6, p. 423} record two cases of gonorrhœa followed by arthritis and certain nervous symptoms, which they refer to a meningomyelitis (postero-lateral columns) originating, they believe, from gonorrhœal infection. In one case gonorrhœal rheumatism attacked most of the joints in succession, and, at the same time, there occurred dorso-lumbar pain with spinal tenderness and rigidity, girdle sensations, pains, acute and sometimes fulminating, in the lower extremities, together with hyperæsthesia, slight paresis, tremor, foot clonus, and exaggerated knee-jerk. These attacks recurred three different times, each attack being coincident with renewal of the urethral discharge and the arthritic trouble. There were no vesical or rectal defects. The symptoms were all recovered from finally, except that spinal rigidity remained. The second case gave a somewhat similar history, except that the motor symptoms were more marked; slight atrophy following in the thighs and legs, but with preservation of faradic excitability. I consider the nervous symptoms in this case as due, not to a lesion of the cord, but to involvement of the spinal nerves in their course through the intervertebral foramina, consequent upon arthritis of the vertebral articulations similar to that infecting the other joints. The symptoms are mostly irritative in character, and, like those seen in Pott's disease, result from a mechanical interference. The grouping of symptoms, their course and terminations, are more in harmony with such a view than with the theory of meningomyelitis. A case of sciatica which they quote may be explained in a like manner, and they admit that it may be neuritis. Moreover, in the two cases cited from Stanly, no lesion was found in the cord to explain the symptoms, except a doubtful congestion

in one of the cases. The authors cite a case by Vulpian, who attributed the lesion to vertebral arthritis effecting compression or irritation of the nerve-roots, but Hayem and Parmentier do not accept this view for their own cases. This result of gonorrhœa, they admit, is very rare.

Ischemic Paralysis.—Bristowe⁴⁷_{Apr} reports a case of mitral disease, with sudden obstruction of the aorta, causing disappearance of pulsation from the abdominal aorta and the arteries of both lower extremities and the left forearm, followed by paralysis of the legs, temporary suppression of urine, and, after partial recovery, by paralysis of the facial and some of the ocular nerves upon the right side.

Sproule⁴¹⁰_{No. I; Nov. 15}⁷⁵ has repeated the Stenson operation of ligation of the aorta on rabbits, confirming Ehrlich and Brieger's observations that temporary (from a few minutes to an hour) obstruction to the circulation results in necrosis of the cellular elements of the gray matter of the lumbar cord and, secondarily, of the medullated nerve-fibres of the gray matter and the central part of the anterior-lateral columns, but not the posterior root-fibres of the posterior horns. The axis-cylinder process of the cells of the anterior horns degenerated in four days. Hypertrophic varicosities of the axis-cylinders precede the granular degeneration of the medullated fibres, beginning on the fourth or fifth day. He found that cutting off the circulation, even for two minutes, was sufficient to produce irreparable damage to the cord—a degree of susceptibility not observed by Ehrlich and Brieger.

Effects of Compression of the Cord.—Adamkiewicz⁸¹_{Oct. 29} maintains that the view that complete anæmia of the cord can be produced by the growth of tumors compressing it is an error; that, on the contrary, the cord will tolerate a great amount of compression without completely obstructing its circulation or producing inflammation. He opened the vertebral canal of rabbits and packed pieces of laminaria against the dura without impairing the functions of the cord. Subsequent examination showed that the cord had been compressed and distorted in form. He contends that it is only when the pressure is great enough to destroy the continuity of the tissues that inflammatory and degenerative processes result.

“*Malarial Paraplegia.*”—Suckling⁴⁷_{Jan.} reports a case under

this title, in which the patient had been severely affected with "ague" in India at different times for many years. In 1886, a fortnight after an attack of "ague," loss of speech came on suddenly, with giddiness for a few hours; speech returned suddenly, but was "thick" for a day or two. Two months later another attack of "ague" occurred, and a fortnight after he suddenly felt what seemed like a blow on the back of the neck; he became giddy, lost power and sensation in legs, and fell. The third day after this attack he was able to raise one leg, and the next day the other; power gradually returned. During the next six years he had several attacks of ague. A day after one of these attacks he felt a girdle pain about the trunk, and two weeks later had an attack of vertigo, was confused and almost unconscious for a few minutes, with loss of speech for an hour, and loss of power and sensation in the legs. The latter continued, with a thick, slurring speech, until the next day, when sensation returned; motility remained absent, but with preservation of normal electrical reactions, normal knee-jerk, absence of plantar and cremasteria and reflexes, and slight incontinence of urine. The next day he rapidly recovered motion, and two days later walked perfectly well. The author thinks that hysterical paralysis may be excluded on account of the bladder symptoms, and that the speech disturbances show that the affection was not limited to the cord. He refers to Gibney's three cases of intermittent spinal paralysis of malarial origin cured by quinine,⁷⁵⁸ No. 1, 762 and to Westphal's case⁴ Nos. 31, 32, 765 of periodic paralysis, in which all four extremities were absolutely paralyzed, this condition being recovered from in less than twenty-four hours. The attacks recurred for several months; electrical excitability was absent during the paralytic period, but there was no malarial history in this case, and Westphal was unable to explain it. Shakhnovitch's case of intermittent paraplegia²⁵ 1884 is also referred to.

C. B. Burr, collaborator, writes that the testimony of the pioneers of Michigan is to the effect that malarial paralysis was not an uncommon condition. Paraplegia was the prevailing type, and was ascribed by the ignorant to "quinine settling in the bones."

"*Urinary Paraplegia.*"—Etienne³⁵ Dec. 22, '87 has discussed so-called urinary paraplegia, and considers most of the cases in literature as inconclusive. Usually the lesions of the urinary apparatus, instead of being the cause of the nervous disturbances, were in reality

caused by the latter. When disturbances of this sort do occur the individuals affected are usually of the neuropathic class.

Traumatic Lesion of the Conus Terminalis.—Oppenheim³⁶⁸_{Bd.20, H.1} reports the case of a male, aged twenty-four, who fell from a second story, striking on his back. After a brief period of unconsciousness, numbness and loss of motility in the lower extremities were observed, which rapidly disappeared, but there remained incontinence of urine and faeces, without consciousness of evacuation, loss of erectile and emissive power, and numbness in the gluteal region; anæsthesia about the anus, scrotum, and penis, and inner side of the thigh; preserved knee-jerk, absence of foot clonus, slight paresis of the calf-muscles. Death occurred some months after from pyelonephritis. The body of the first lumbar vertebra was found crushed, and the conus terminalis diseased, its dorsal portion being transformed into a mass of tissue filled with bloody lymphoid bodies, granule cells, and newly-formed vessels. The ventral part was not so completely disorganized, but most of the nerve-fibres and cells were destroyed. The pia was much thickened. The lesion did not quite reach to the origin of the sciatic. Above the lesion degeneration was found in the columns of Goll only. The nerve roots from the injured portion were degenerated; the remaining portion of the cauda equina was normal.

INJURIES TO THE CAUDA EQUINA.

Thorburn, of London,⁴⁷_{Jan.} reports four cases of injury of the cauda equina, two of compression, the result of vertebral dislocation, one of tumor, and one of spina bifida with involvement of the cauda equina in the cicatrix. The distribution of sensory and motor impairment shows that even when the entire cauda equina is involved by a pressure lesion those nerve-roots which emerge lower down are more seriously injured than those above them. The three conditions most likely to be confounded with compression of the cauda equina are posterior spinal sclerosis, injury or disease of the lower part of the cord, and extraspinal nerve injuries and diseases. He advises trephining in cases of injury when we are sure of the localization. This was done in one of the cases reported, but not until several months after the injury. It resulted in improvement of sensation, but some paresis remained.

Elliott¹⁰² reports a case of Pott's disease producing pressure

of the cauda equina and accompanied by ascending degeneration of the posterior column of the cord. He also discusses the nature of the destructive lesion of the cord in Pott's disease, and concludes that in the vast majority of cases it is purely a mechanical effect, as compression from an abscess, thickened dura, or bone. The damage is commensurate with the pressure exerted, and not of inflammatory origin, though he admits that in certain cases a true myelitis of inflammatory origin may occur. Compare these views with Adamkiewicz's observations, given above.

POLIOMYELITIS.

Kahler⁸⁴_{Dec. 17, '87} describes a case of *poliomyelitis anterior acuta infantum*, which occurred soon after birth and involved all the extremities. At five years of age only the slightest trace of power remained in the upper extremities. Sitting in an upright position was impossible. The feet were in a position of talipes equinus, the heel standing nearly at right angles to the plantar surface. The toes were long and finger-like, and were not only strong, but the patient was capable of executing complicated movements with them quite skillfully in place of hands.

Fry, of St. Louis,⁸²_{Jan. 24} in a clinical lecture, describes a case of poliomyelitis anterior acuta infantum of paraplegic distribution, in which the left abdominal muscles and the erector spinæ of the same side were involved, but did not become evident until after the lower extremities had recovered. This condition of involvement of the abdominal muscles was described by me in 1880 in reporting two cases which I had observed. I was able to find a record of but two similar observations in an analysis of two thousand cases of poliomyelitis recorded in European and American literature and in hospital records at my disposal.

Shaw, of St. Louis,⁷²_{Sept.} reports "a case of infantile paralysis in which static electricity proved curative when the faradic and interrupted galvanic currents failed to produce muscular contractions." The details of the report show, on the contrary, that the muscle did respond to the galvanic current, though only on anodal closure, even this soon becoming exhausted, while the so-called static induced current gave fairly good contractions. Furthermore, the curative effect, which, it is acknowledged, was not complete at the time reported, should not be claimed for static electricity

alone, as the galvanic current was also used during the entire period.

Cordier ²¹¹ ⁵¹ reports thirteen cases of "infantile atrophic paralysis," occurring as an epidemic in the months of June and July, 1885, in a district containing fourteen hundred to fifteen hundred inhabitants. Four of the youngest patients died at the end of the third day. The ages of those affected were from ten to thirty months, boys and girls being affected in about equal numbers and severity. Most of the patients were healthy before the onset, which began with fever of variable degree without premonitory symptoms. Convulsions occurred in half the cases without reference to the gravity of other symptoms. Profuse sweating occurred during the febrile period, usually, but was absent in the fatal cases. Paralysis appeared in several cases, after the second or third day, in the lower extremities, or in all four at the same time, and in some cases involving the neck-muscles. Paralysis did not disappear with equal rapidity in all; it would reappear in summer and remain stationary in winter. The writer considered the disease as probably of infective origin and possibly of a contagious nature.

Gordinier, of Troy, ⁹ ^{Aug. 18} reports a case under the title of "Chronic Ascending Paralysis," in which Starr, of New York, examined the specimens, finding, in addition to degeneration of the ganglion-cells of the anterior horns, sclerosis of the posterior root-zones, most marked on the right side, which, during life, presented absence of the knee-jerk. On the left side the tendon reaction was present, but diminished.

ACUTE ASCENDING PARALYSIS (LANDRY'S).

Iwanow, of St. Petersburg, ²¹ ^{Nov. 12} reports two cases of this rare and interesting disease, of value on account of the pathological changes found in the cord, in view of the usual negative findings in this affection. Case I. Male, aged seventeen, twelve days before his death began to have general weakness, chiefly in the lower extremities, without fever, pain, or any sensory disturbance except slight formication in the arms and legs. The paresis increased, so that in four or five days he was unable to stand or walk alone, his arms becoming rapidly involved, and finally the muscles of deglutition. The knee-jerk was barely perceptible, the

plantar reflex abolished, but sensation to pressure, temperature, pain, and tactile impressions was preserved. The feet were possibly a little less sensitive to pain than normal. No muscular rigidity existed. The vesical functions were normal. Microbriasis was present, but no other ocular symptoms. At least complete paralysis of the arms, legs, trunk, and the muscles for deglutition and respiration occurred, and death from asphyxia. Case II. Male, aged twenty-seven, eight days before death began to lose power rapidly in the lower extremities; the arms became involved, the diaphragm also. The knee-jerk disappeared; the tactile and pain senses were somewhat reduced, particularly on the left side in the feet and legs. The bladder remained normal, the pupils were dilated, the right more than the left, and finally there occurred imperfect deglutition, difficult respiration, and death. The patient gave a history of chancre, without secondary symptoms, two years previously. No electrical examination was made. (The sensory symptoms, though slight, might be considered by some as sufficient to exclude the cases from Landry's disease.) The pathological changes found in the cord were alike in the two cases, except in degree. They were limited to the region about the central canal with extension into the anterior horns, and consisted of an exudation of lymphoid bodies imbedded in the tissues and of a fibrinous exudate around the vessels and nerve-fibres distending the space between the normal elements, apparently the effect of an inflammatory process. In places where the changes are most pronounced, disintegration of the nerve-fibres was observed, also swelling and indistinctness of the nerve-cells. Farther away from the central canal, clear spaces about the vessels seemed to indicate a condition of œdema. From the changes being more pronounced near the central canal, the writer infers that the pathological process commences in this region. The lumbar and cervical enlargements exhibit a concentration of the process, chiefly the former, where it probably begins, while in the intermediate region the changes were much less marked. The medulla was found normal in the first case, and was not examined in the second. The nerve-roots and meninges were normal. Examination for bacteria by Gramme's method gave negative results. The writer reviews the negative examinations of the cord in this disease advanced by Ranvier, Vulpian, Westphal, Bernhardt, Déjerine, and Götz, and

the positive cases of Lockhart, Clark, Baumgarten, and Eisenlohr. The findings of the latter observers he considers as in harmony with his own. Clark described a fluid exudation around the vessels about the central canal at a level with the lumbar nerves. Baumgarten describes an exudation poor in cells infiltrating the gray commissure, filling the central canal, and surrounding the neighboring blood-vessels, chiefly found in the lumbar enlargements and the lower cervical region. In Eisenlohr's case a similar exudation was found, mostly limited to the lumbar enlargement, and the cervical region at the level of the third cervical nerve, shading off to an imperceptible degree between these regions, but extending to the medulla to some extent. Iwanow suggests that the negative results of other observers may be in consequence of the changes being in some cases so slight that they escape recognition, or that the regions of the cord in which the changes are chiefly concentrated, which, as shown in Clark's, Eisenlohr's, and his own cases, may be quite limited, may have been overlooked (in one of Westphal's cases only the cervical region was examined); or, again, the duration of the disease may make a difference in the appearances. In cases running a longer course the exudation may be partly absorbed or have undergone changes leaving no recognizable traces. Two of Westphal's cases continued for about four weeks.

POSTERIOR SPINAL SCLEROSIS.

Cerebral Complications.—J. C. Shaw, of Brooklyn, ^{July 14} under the title "Apoplectiform, Epileptiform, and Hemiparetic Attacks in Locomotor Ataxia," reports four cases which he has observed and cites others in literature in illustration of this subject. One had an attack of hemiparesis lasting a few days, another had loss of consciousness without convulsions, a third had loss of consciousness for a few minutes, followed by thickness of speech and weakness of the right side. Syphilis was denied in these three cases. A fourth had what appeared to be a combination of paresis and ataxia upon one side (face, arm, and leg) of sudden onset, without loss of consciousness, and lasting a day or two; followed by severe headache, which continued for twenty days. He acknowledged syphilis. The symptoms of tabes were of the usual type. Shaw believes that apoplectiform and hemiparetic seizures are not infrequent, and that their importance as a part of the clinical history

of tabes has not been sufficiently recognized. He is unable to offer a satisfactory explanation for the sudden and temporary attacks, not being willing to accept the theory of localized congestions. He considers Grasset's view not without foundation, that instead of being a disease confined to the posterior columns of the cord, tabes is really a more diffuse lesion of the cerebro-spinal axis.

Bullen, of England, ⁴⁷_{Apr.} reports a case of posterior spinal sclerosis and general paralysis of the insane with a thorough microscopical examination.

Pick reports a case of general paralysis of the insane with degeneration of the posterior columns and failure of the knee-jerk upon one side only. The degeneration in the cord was much more marked on the side corresponding to the defective knee-jerk, and involved the root-zones between the dorsal and lumbar regions. Pick thinks that the fibres concerned in transmitting this reflex do not form a compact bundle, but are diffusely distributed throughout the nerve-roots and are few in number.

Ocular Symptoms.—E. Berger ³_{June 13} has investigated the ocular conditions in one hundred and nine tabetic patients. He finds that there is (1) a diminution of intraocular tension of variable degree and considerable hypertonia, greatest in the paralytic period, least in the pre-ataxic period; (2) slight paralysis of the involuntary muscles of the lid, increasing from the pre-ataxic to the paralytic stage, and followed by a slight retraction of the palpebral fissure; myosis co-exists in a certain number of cases; (3) a deformity of the pupil, its circular form being converted into an elliptical contour. He refers these changes to the sympathetic, as analogous results follow its section, but not necessarily as the primary cause; the sympathetic may be only a pathway transmitting an irritation from the spinal cord to the eye.

Galezowski ³_{Feb. 25} describes as prodromic signs of tabes, unilateral paralysis of the muscles of accommodation associated with anæsthesia of the corresponding periorbital region, unaccompanied by mydriasis of other ocular paralysis. He has observed this combination of symptoms when no other signs of tabes were evident except enfeeblement of the tendon reflex, and considers them of pathognomonic value. These signs may occur in hysteria, but mydriasis is also present. Paralysis of accommodation occurring

in diphtheria is binocular, and that resulting from contusions of the eye is unaccompanied by anaesthesia. Of ten hundred and sixteen cases of optic-nerve atrophy which he had observed, eight hundred were in tabetic patients, more than half of which were syphilitic.

Trigeminal Involvement.—Bernhardt⁶⁹_{80, 82} reports the case of a tabetic patient who had peculiar symptoms referable to involvement of the ascending roots of the trigeminus, namely, a sensation as if the face were swollen, particularly the lips, drinking from a cup being difficult from his not appreciating the portion of the cup touching the lips; speech was also interfered with through imperfect action of the lips, due to sensory impairment.

Laryngeal Ataxia.—Gay¹⁷_{Jan} reports a case in which he admits that the evidence of its being primarily one of tabes dorsalis is not great, but sufficient to establish the diagnosis. There was absence of the knee-jerk, presence of the Argyle-Robertson pupil, ptosis, numbness, and inco-ordination of the fingers; but no abnormality of motion or sensation in the lower extremities, and the pain in the legs was described as aching rather than lancinating. Micturition was normal, there was no constriction band, no optic atrophy, no bulbar symptoms except the laryngeal ataxia to be described. In speaking a rapid change occurred every three or four words, from his natural, rather deep-toned, voice to a high falsetto key resembling the cracked voice of puberty. Laryngoscopic examination showed total loss of rhythm and regularity of action of the cords. They were capable of being completely adducted during phonation and abducted during inspiration, but the latter by starts and jumps only. Sometimes they would separate for two or three millimetres, hesitate, and then actually come together again before being suddenly and fully abducted. They always acted in unison, but the left seemed fully abducted. There was no history of laryngeal crises. I have observed a case of posterior spinal sclerosis with the characteristic voice described above, but in which laryngoscopic examination failed to reveal anything peculiar. Later the patient developed laryngeal crises.

Cardiac Disease.—Groedel⁶⁹_{May 12} attracted by the statements of Berger and Rosenbach (1879), concerning the frequent association of aortic insufficiency and tabes, and those of Angil (1880), on the coincidence of cardiac lesions with tabes, has studied this

feature in one hundred and eight cases of the latter disease. He found but four cases of valvular cardiac disease, two of aortic and two of mitral insufficiency, and in them there was no reason to suspect that the cardiac lesion was dependent upon the lesion of the cord. He concludes that the association is merely a coincidence. On the other hand, small and frequent pulse and feeble heart-sounds are very frequent, though not more characteristic of tabes than of any chronic disease accompanied by anemic and neurasthenic conditions. Sensations of constriction and pressure in the region of the heart are often described, and are probably irregular forms of "girdle sensation" (two cases reported), but there also occur attacks resembling angina pectoris, already described by Leyden (four cases) and by Vulpian (one case), and of which Groedel reports a case. He favors Leyden's theory that they are attacks of neuralgia affecting the cardiac branches of the pneumogastric—neuralgia analogous to the gastric, laryngeal, and bronchial crises.

Leyden ⁶⁹_{Nov. 8} more recently reported a case of tabes with aortic insufficiency in which the autopsy revealed also arterio-sclerosis of the aorta, and in discussing the theory that valvular lesions in tabes may depend on dystrophic changes, the result of the cord lesion, he concludes that it is hardly possible that this arterio-sclerosis could originate in this manner, and agrees with Groedel that the association is probably only an accidental one. In the discussion which followed, Remak, Guttmann, and Oppenheim confirmed the view that valvular disease with tabes is rare. Oppenheim considers that while there may be no direct association, yet they may have a common cause, such as syphilis. Guttmann observed only three cases of valvular disease among one hundred cases of tabes.

Bulbar Symptoms.—Oppenheim ⁴_{No. 29} reports two cases, with autopsies, interesting on account of their bulbar symptoms. Case I. At an early stage pain began in the head, face, and left half of the tongue; later, right-sided itching of the face and slight anaesthesia of the right forehead and right half of the tongue. Portions of food remained in the month. Protrusion of the tongue could only be performed when the patient could control its movements by watching it in a mirror. Laryngeal crises, rapid pulse, and a rough voice appeared at an early stage, and laryngeal

paralysis was evident on examination. Later, deglutition crises, or spasms, occurred, lasting from a quarter to half an hour, which could be provoked by pressing upon a point between the larynx and sternocleidomastoid muscle. The autopsy revealed, besides a typical degeneration of the posterior columns, the following changes: The ascending root of the fifth nerve was degenerated throughout its entire length. The descending root and motor root of the fifth were normal. Of the vagus accessorius tract, the ascending root was completely degenerated up to the nucleus of the eighth. The outgoing vagus root showed decided changes; its trunk was also markedly atrophic. The superior laryngeal nerve, however, was normal. A branch of the glossopharyngeal nerve was degenerated. Case II. Following a rapid and severe course, a peculiar sensation of tension was felt in the face, mastication and deglutition were difficult on account of disturbances of sensation, notwithstanding preservation of motor power. After several months, ataxic facial movements were observed during speech and mastication. The autopsy revealed degeneration of the posterior columns, the posterior roots were decidedly vascular,—an unusual condition, but consistent with the rapid progress of the disease. The degeneration extended into the corpora restiformia. There was also atrophy of the ascending roots of the fifth pair throughout their entire length.

Cervical Tabes.—Martius⁴¹ describes the case of a male, aged fifty-three, who, after an attack of typhoid fever, developed numbness and stiffness of the finger-tips; later, similar symptoms accompanied by weakness appeared in the lower extremities. Two months later numbness of the hands and feet was still present. He could not stand with his eyes closed, and was unable to bring his fingers together with the eyes closed. The knee-jerk was present, the Argyle-Robertson not present. He died from pneumonia. In the examination of the cord the lumbar enlargement was not found degenerated. In the dorsal region there was slight degeneration in the columns of Goll, but not of the root-zone; in the cervical region partial degeneration of the columns of Goll and very marked degeneration of the postero-external columns between the root-zone and Goll's columns.

J. Déjerine⁴² found among one hundred and six cases of tabes only one in which the symptoms began in the upper extremities.

A male, aged forty-nine, with no history of syphilis, in 1883 had disturbance of vision, diplopia; later, strabismus; in 1887 was found with bilateral paralysis of abducens, double optic-nerve atrophy, myosis right, mydriasis left, lancinating pain and ataxia in the arms, retarded conduction of sensation to painful and tactile impressions in the arms and face, and, to a less degree, in the back, but no disturbance in the lower extremities except that the deep reflexes were lost for the rectus and vastus externus but preserved in the vastus internus and adductors; the plantar reflex was also preserved. There was no visceral disturbance. Examination revealed total degeneration in the upper cervical region of the posterior columns, posterior horns, and roots, except a small triangular portion at the periphery of the columns of Goll and a small point behind the posterior commissure. In the lower cervical region the change in the posterior horns and the columns of Goll became less marked. The middle dorsal region showed normal nerve-fibres, even in the columns of Burdack, while the posterior third of the columns of Goll was entirely normal. Of Clark's column only the fibres were affected. In the lumbar region traces of degeneration were found in the columns of Burdack only. In the medulla oblongata the degeneration of the posterior columns ended in their nuclei. The sensory and descending roots of the fifth nerve were decidedly atrophic. The cutaneous peripheral nerves of the arms were slightly changed.

Finny ⁶_{Aug. 11} also reports a case of tabes in which the upper extremities were predominantly affected at an early period, though the lower extremities also presented the usual symptoms in a moderate degree. Dr. Bewley, who examined the cord, found sclerosis of the posterior columns, but most marked in the cervical region. There was the further peculiarity that, while the sclerosis invaded the posterior portion of the postero-external column in the cervical region, the middle portion was not sclerosed, and the anterior portion was again sclerosed. The posterior third derived its ascending fibres from the lumbar region, in which there was some disease, and these fibres were, consequently, degenerated. The dorsal region was not much diseased, and the middle third, containing fibres from that portion, was, consequently, fairly healthy. The anterior third, containing ascending fibres from the diseased cervical region, was much sclerosed.

Weir Mitchell²⁴²_{Apr.} reports a case without autopsy, which he characterizes as an attack of locomotor ataxia affecting practically the upper extremities. When the diseases in the legs were pretty well advanced in their degenerative course, the tendon reflexes were lost in the arm, but the knee-jerks were excessive.

"*Pseudotabes*."—Pitres⁹⁴_{May} reports the case of a male, aged thirty-five, who developed, after a previous state of good health, a number of symptoms characteristic of posterior spinal sclerosis, namely: fulgerating pain, inco-ordination of the lower extremities, gastric crises, dullness of cutaneous sensibility, and retarded sensation. These phenomena persisted for ten years. Death resulted from acute tuberculosis, and, at the autopsy, no organic alteration was found in the cord nor in the spinal nerves or nerve-roots. Of the visceral nerves (splanchnic, pneumogastric, laryngeal, and phrenic), the left recurrent laryngeal showed considerable atrophy, also the branches to the stomach and heart. It is to be noted that the knee-jerks were normal, the superficial reflexes normal, and also the pupillary phenomena. M. Pitres asks, "Are we to conclude that locomotor ataxia may be a neurosis?" and answers, "Certainly not, but that it must be admitted in certain cases that functional troubles may occur capable of presenting a group of symptoms analogous to those characteristic of tabes."

Perforating Ulcers.—H. Hanford⁵_{Sept.} reports a case of perforating ulcer of the feet of at least ten years' standing, presenting other symptoms of posterior spinal sclerosis. There were ptosis, optic-nerve atrophy, arthropathy of the right knee, absence of knee-jerk, sensory disturbance, but no inco-ordination, and a doubtful perforating ulcer of the tongue. Fifteen years previously his right great toe was crushed, but healed, and remained sound for four or five years before the first ulcer appeared upon it, followed a few months later by one on the opposite great toe. His toes were amputated and healed, but, later, ulcers appeared on the left stump. There is a history of gonorrhœa and a sore on the penis twenty years before, not followed by secondary symptoms.

Injuries to the Peripheral Nerves as a Possible Cause of Tabes.—Spillman and Parisot⁹²_{Mar.} have analyzed fourteen cases of posterior spinal sclerosis associated with peripheral injuries of various kinds, and discuss the question as to whether this disease can originate from such injuries. They conclude that when there

is a neurotic predisposition, individual or hereditary, a traumatism of even a slight degree may be the exciting cause. Fractures, contusions, and wounds of the extremities, or even the extraction of teeth or the operation for cataract, may precipitate the disease. The first symptoms of tabes almost always appear, they claim, in the injured member after intervals varying in the different cases from a few weeks to eighteen years. Alcoholism, syphilis, and rheumatism are admitted as accessory predisposing causes.

Chavanis,²²⁸
Nov. 13 under the title, "Ataxia of Traumatic Origin," describes a case of myelitis following a blow upon the back, producing paraplegia and sensory disturbances of the lower extremities, chiefly on the left side, followed later by another injury and ataxia and loss of the knee-jerk on that side only.

Lesions of the Peripheral Nerves.—Nonne³⁶⁸
B4.19, H 2 describes cases of involvement of the peripheral nerves which developed during the course of tabes: (1) neuritis of the nerves of the small hand-muscles, with atrophy and reaction of degeneration accompanying the first symptoms of tabes; (2) musculospiral paralysis with reaction of degeneration during the incipient stage; (3) transitory paresis in the peronei at an advanced stage of the affection; (4) partial degeneration of the small hand-muscles at an advanced stage. A fifth case reported proved to be multiple neuritis.

J. C. Shaw²⁴²
July reports a case of "typical locomotor ataxia" (but which, the history shows, was also a case of dementia paralytica) in which changes were found in the peripheral nerves (sciatic, popliteal, plantar) in addition to the usual changes found in the cord. He considers that the histological alterations were different from those of the Wallerian degeneration, and resemble instead the condition described by Gombault in 1880, observed in the sciatic of fowls after chronic lead poisoning in 1882 by P. Meyer, and again in 1886 by Pitres and Vaillard in diphtheritic paralysis, characterized by absence of increase in the interannular nucleus, preservation of the axis-cylinder, and the appearance of changes in certain parts of the nerve, while those portions above and below remain comparatively healthy, and by the greater number of tubes in which the myelin evidently undergoes a rapid granular liquefaction rather than a breaking up into blocks.

The most important communication respecting changes in the peripheral nerves in tabes has been presented by Déjerine,⁵⁵
Mar. 10 who

has investigated the subject of muscular atrophies accompanying posterior spinal sclerosis. He found them in twelve out of one hundred and six cases. It is his opinion that they are not the result of involvement of the anterior horns, but are of peripheral origin. His views are based on the results of histological examination in five cases representing advanced stages of tabes. In three of them the muscular atrophy was of the Aran-Duchenne type, in a fourth case of the scapulohumeral, and in the last there was atrophy of the thenar muscles only. With two, the legs were also atrophied. There were no fibrillary contractions, and the atrophy was very slow in its development. In all of the cases sclerosis of the posterior columns and posterior roots was found, but no involvement of the cells of the anterior horns or of the anterior roots. The wasted muscles showed atrophy with pigmentation and interstitial steatosis. The intramuscular nerves and their corresponding trunks showed marked degenerative neuritis of similar appearance to that found in the posterior roots at an advanced stage of posterior spinal sclerosis. As the larger nerve-branches were reached, the changes became less evident, and the large trunks were mostly normal.

Psoriasis as a Symptom of Tabes.—Ssirski, ²¹_{Jan. 16} accepting Polotelnow's view that psoriasis is a vasomotor neurosis of the skin and one which may result from one of the profound affections of the nervous system, describes very fully a single case of tabes in which psoriasis developed, and which he regards as a symptom of the former disease. In addition to the typical features of posterior spinal sclerosis, what the writer calls an exaggerated "vascular reflex" was observed, irritating the skin mechanically, electrically, or chemically, producing an erythema extending a little distance beyond the point excited, and persisting for some time; frequently urticaria-like wheals resulted from such excitation. The patient finally recovered from his psoriasis, and the "vascular reflex" then greatly diminished. As the writer claims that his is the first and only case observed of psoriasis associated with tabes, is not the assumption that the former is a symptom of the latter based upon rather a slender foundation?

The Urine.—Under the title, "Researches upon the Urine of Tabetics," C. Livon and H. Alezais, ⁴⁶_{pp. 193, 261} report seven cases in which they found the quantity of urea and of phosphoric acid ex-

creted small, and a tendency to hyperexcretion of the chlorides. The urine was found more toxic than normal urine when administered to dogs by intravenous injection. An examination of these cases shows that they are not simply cases of posterior spinal sclerosis, but include a variety of complicated forms. Two are cases of diffuse myelitis, two others appear to have had multiple sclerosis, one had amyotrophic complications, another had symptoms of posterior spinal sclerosis engrafted upon a former infantile spinal paralysis, and the remaining cases, in addition to tabes, had phthisis?

Tabetic Diarrhœa.—Mathieu,⁷³_{Nov.} in reviewing the statements of Charcot, Vulpian, Pitres, Fournier, Putnam, and others concerning diarrhœa in tabes dorsalis, reports the case of a man, aged fifty-five, who gave a typical history of posterior spinal sclerosis, and whose diarrhœa had continued for twenty years, having originated after an attack of cholera. He had from six to ten stools a day without pain or tenesmus, sudden and rapid evacuation of a yellowish liquid never mixed with mucus. It was not relieved by treatment.

Syphilis and Tabes.—Carmelo Andronico,⁵⁴_{Jan.} in considering the relations of syphilis to tabes, concludes that the former is more of a predisposing factor than a direct cause, reducing the power of resistance of the nervous system against disease. In the examination of great numbers of prostitutes, he found tabes rarely present. In six cases of tabes in females exposed to bad hygienic surroundings, such as cold, dampness, and exhaustive muscular labor, only one had had syphilis.

A Claim of Cure.—Pacheco, Brazil,¹²⁹_{Oct.} reports the complete cure, within a few months, of a case described as "locomotor ataxia," treated by faradism and various drugs given according to the dosimetric method. I regard this case, in all probability, as one of multiple neuritis of either the alcoholic or the beri-beri variety, as the symptoms described were loss of power, accompanied by general pains, diffused œdema, anorexia, pain in the thorax, præcordial pain extending to the neck and shoulders, difficulty in breathing, disturbed heart's action, and coldness of the extremities. The patient drank half a pint of brandy every night and had enlargement of the liver.

Ataxia in a Donkey.—Drummond¹⁷_{Jan.} had his attention called

to a donkey of uncertain age, but said to have reached his twentieth year, who displayed a most singular gait, characterized by the grossest inco-ordination, amounting almost to the grotesque. He reeled from side to side and staggered along, throwing out his legs in a most irregular manner; occasionally he seemed on the point of falling, but always managed to save himself. The impairment appeared to be due more to a want of control than to actual paralysis. The pupils were mere pinholes and did not respond to any form of stimulus. He was unable to walk with the eyes blindfolded, but fell to the ground. The resemblance of the ataxia to that of tabetic patients led the doctor to effect a purchase of the animal and an autopsy resulted. Sections from the lumbar enlargement of the cord, stained in carmine after hardening, showed a deep-red zone extending nearly half-way around the postero-lateral surface, which proved to be a marginal or annular myelitis, or sclerosis. It embraced both posterior roots and extended into one lateral column. The changes were evidently chronic and appeared to be independent of meningitis. They were essentially interstitial—a dense overgrowth of neuroglia, with large numbers of nuclei and few nerve elements. The remainder of the cord and the sciatic nerves were normal.

THE TENDON REACTION IN HEALTH AND DISEASE.

The term "tendon reaction," employed by Raven, I prefer to others in use as a general term for the phenomena known as the knee-jerk (Gowers), the knee-phenomenon (Westphal), the patellar tendon reflex (Erb), the elbow-jerk, joint-jerk, jaw-jerk, etc., retaining these terms, however, to indicate specifically the tendon referred to. Articles on this subject have appeared during the past year from H. P. Bowditch,⁹⁹ S. Weir Mitchell,⁹ F. F. Raven,¹⁵ N. P. Lombard,⁵⁹ J. W. Warren,⁵⁹ G. Guinon,¹⁰⁰ Nonne,³⁴ Goldflam,⁷⁵ Sinkler.⁹

Mitchell presents a lucid and interesting review of the whole subject, and describes the results which have followed upon Jendrassik's discovery that the knee-jerk is increased by strong voluntary effort, as by vigorously grasping one hand with the other, termed by Mitchell and Lewis "a reinforcement." It was found by the latter investigators that not only powerful muscular acts produced this effect, but that winking, speaking, coughing, or laughing were

usually sufficient to increase the tendon reaction, and, furthermore, that, besides motor reinforcement, sensory reinforcement was also demonstrable. Pulling a hair, touching the skin with ice or a hot object, pinching, or electrical excitation upon any part of the body increased the tendon reaction. Then Lombard, by more accurate laboratory methods, showed the influence of fatigue, sleep, and changes in the weather upon tendon reactions and made the interesting discovery that emotion powerfully affects the reaction. The cry of a child, a knock upon the door, affecting music, or the recital of an affecting quotation increase the knee-jerk. Bowditch and Warren, going still further into the refinement of the question, concluded from their experiments that the effect of reinforcement varied according to the interval of time by which the reinforcing act preceded the blow upon the tendon. If the blow follows by an interval not greater than 0.4" the knee-jerk is increased; if it exceed this amount diminution results. In other words, the reinforcing act produces a state of exalted activity, followed by a depression and a subsequent return to the normal state—periods of very brief duration. Concerning the manner in which the reinforcement produces its effect, there is the view that the inhibitory action of the cerebral centre is cut off from the parts below through this energy being diverted to other paths by the voluntary act, and, on the other hand, there is the overflow theory that an excess of energy is expended in the volitional act which exalts the excitability of other centres than those involved in the act itself. In absence of certainty as to which is the correct view, Mitchell is inclined for the present to consider all reinforcements as overflows and all abnormal increase of the tendon reactions as the product of irritative lesions. Still more doubtful is the question as to whether the tendon reaction is a direct muscular process or a spinal reflex act. The duration of the reaction period, it has been shown, is shorter than that required for known spinal reflexes. This is considered by many as a fatal objection to the reflex theory, while, on the other hand, the fact that section of either the sensory or motor spinal nerve-roots is sufficient to abolish the tendon reaction at once shows that in some way the spinal functions are essential factors in the process. It has been thought that excitations are continually transmitted from the cord to the muscles, maintaining what is termed "tone" of muscles, but Lombard, as a result of

his experiments, could find no proof that "muscle tonus" is continuous, nor was he able to show that the irritability of a muscle to a mechanical stimulus is dependent on its tension, as Gowers maintains. On the contrary, he claims that the extent of the knee-jerk is independent of the tension of the muscles and may be present regardless of the amount to which the knee is extended. Together with Mitchell, Bowditch, and Horsley, he favors the view that it is a reflex act, and that this particular form of reflex may have a shorter time reaction than others. This, however, still remains to be proven. H. C. Wood, in the discussion which followed Lombard's paper, contended that it may not be a reflex act and still not be dependent upon tension of the muscle; that it is not unlikely that the irritability of the nerves in the sarcolemma of the muscle is dependent on the spinal cord, and that the knee-jerk is dependent upon the irritability of these nerves. Bowditch replied that irritability of the nerve is not lessened for some time after section, yet the knee-jerk is lost immediately.

Guinon's article contains a good *résumé* of the semeiological value of the tendon reaction in diseases of the nervous system. Raven, among fifty-four men and women over seventy years of age, found the knee-jerk absent in twelve. Some condition of disease accounted for its absence in ten of the twelve cases. Goldflam claims that inequality of the knee-jerk is an important diagnostic sign of posterior spinal sclerosis, though by no means pathognomonic. He recites seven cases of the latter disease in which it was observed—not an exaggerated reflex on one side, with the other side normal, as seen in hemiplegia, but usually a great reduction upon both sides, one more than the other; or on one side it may be absent, or only to be developed by reinforcement. There is also inequality in the degree of reaction at different times upon the same side, several blows alike in force and location producing variable results. It represents an early stage of the disease, and is finally followed by complete loss of the tendon reaction. Wharton Sinkler describes what he calls the "great-toe reflex." It is, he claims, only to be found in cases where the other tendon reactions are overactive, and is produced by grasping the great toe and flexing it strongly; this is immediately followed by involuntary flexion of the foot, the leg, and finally of the thigh upon the pelvis.

COMBINED SPINAL SCLEROSIS.

Combined sclerosis of the lateral and posterior columns, to which Gower has given the name "ataxic paraplegia," and Dana the term "progressive spastic ataxia," Preston, of Baltimore,²⁴²_{Apr.} suggests should be called ataxic lateral sclerosis, an unfortunate choice, as this combination of semeiological and anatomical terms is incomplete, the author admitting that the lesion is a posterior-lateral sclerosis, and the symptomatology a spastic ataxia. He reports a case without autopsy. Putnam⁵⁹_{June 28} reports the case of a female, aged fifty-eight, with a doubtful syphilitic history, whose symptoms began by numbness in the fingers. There was ataxia and paraplegia of the upper and lower extremities, but no lancinating pains. The case was complicated with dementia. No examination of the brain was made. The cord showed sclerosis of the posterior columns throughout their entire length. Changes in the lateral columns involved the pyramidal tracts up to the middle cervical region, where the direct cerebellar tracts took on the same appearance, the sclerosis in the pyramidal tracts becoming less. Starr⁵⁹_{June 28} has reported a case without autopsy.

FRIEDREICH'S DISEASE.

The most important paper of the year upon this rare disease is an analysis of the cases recorded in literature to the present time by Griffith, of Philadelphia,⁵_{Oct.} to which he adds two cases of his own. He has collected one hundred and forty-three cases, reported by fifty-eight observers. Friedreich's first cases were published in 1863; in 1876 the number on record was twenty; at the end of 1882, forty-seven, and now one hundred and forty-three. Griffith prefers the name "Friedreich's ataxia," as the term Friedreich's disease is also applied to para-myoclonus multiplex. Friedreich himself called it "hereditary ataxia." Of the one hundred and forty-three cases, eighty-six were males and fifty-seven females; they were divided among seventy-one families, but in twenty-four instances only one child was affected. Direct inheritance of the disease itself or of some form of ataxia is reported in only thirty-eight cases, in sixteen families of brothers and sisters. Alcoholism occurred in the parents in thirty-one cases; in other relatives, but not in the parents, in thirteen cases. In seven cases it was the only predisposing cause found. Tuberculosis and syphilis he

considers bore no influence except as they debilitate the constitution of the progenitors. Syphilis was present in but two families. Of two children of a phthisical mother and suckled by her, one died of phthisis and one had Friedreich's ataxia; other children fed by a wet nurse remained healthy. Consanguinity is reported in four families. There were thirty-one children reported ataxic in twenty families, but not seen by a physician. In one-fourth of the cases the first symptoms appeared before the age of six years; in over one-half before the age of eleven years. In fifteen cases the disease began in infancy, and in not more than twenty-five did it develop after the sixteenth year. The influence of acute and usually of febrile diseases in precipitating the onset is seen in twenty cases. The disease began with weakness and unsteadiness of the lower extremities in one hundred and fourteen of the one hundred and forty-three cases; in ten cases the arms and in eight cases the arms and speech were involved simultaneously with the legs; in two cases the legs and speech were first affected, and in two the arms alone. The average lapse of time before the upper extremities became ataxic is six years. In one case it was twenty years, in another seventeen years. Bulbar symptoms appeared in one and one-half years later than ataxia of the arms in thirty-one cases. In eighteen they were simultaneous. As the disease advances, there may be more or less paralysis, muscular atrophy, talipes and other contractures, curvature of the spine, and possibly affections of sensation. There may be inability to walk and marked speech disturbances. Death results from asthenia, or, more frequently, from intercurrent disease. Of the individual symptoms ataxia of the lower extremities was present in one hundred and twenty-eight cases and implied in some others. Ataxia was increased by closing the eyes in thirty-four cases, and not increased in nineteen. Static ataxia was reported in seventy-three cases and probably present in many more; of these forty-nine presented Romberg's symptoms, and ten did not. Ataxia on motion in the upper extremities is reported in one hundred and eleven cases, in twenty-one increased by closing the eyes, in twenty-six not increased. The gait is oscillating, "like that of a drunken man," with lateral projection of the feet instead of the forward tendency seen in tabes. Prehension is peculiar, the hand being spread like a claw. Tremor in some part of the body is referred to in eight cases, probably attrib-

utable in most cases to static ataxia; likewise the choreiform movements in seventeen cases, usually in the limbs but in six cases in the face; spasmodic contraction, an early symptom, occurred in twenty-one cases, mostly in the lower extremities, while sitting or lying. It occurred on the face in one case. Paralysis is reported in fifty-six cases, and was probably present in many others; its progress variable, from eight to forty years. The so-called early paralysis is probably due to inco-ordination. Inability to walk without crutches or assistance occurred in fifty-four cases, resulting usually from inco-ordination. Permanent contractures are among the late symptoms. Talipes equinus and equinovarus occurred in twenty-seven cases. Contractures in the fingers, hands, and arms were rarely present. Curvature of the spine, usually lateral, considered by Rüttemeyer as a form of contracture, developed (fifty-seven cases) as the disease advanced. Electrical contractility was not sufficiently studied. It was usually normal, sometimes diminished, and still less frequently increased. In three cases the reaction of degeneration was present. Abolition of the knee-joint is an early and almost constant symptom. It is reported absent in ninety-one cases, and in thirty no observation was made. In seven cases it was much diminished, in two moderately diminished, and in six normal; in one exaggerated or normal, in six exaggerated. Exaggeration of the knee-joint does not exclude it from Friedreich's ataxia, as two of the cases were in family groups. The cutaneous reflexes were usually normal. Of trophic symptoms, muscular atrophy was present in eleven to a marked degree and slight in twenty-four, affecting the lower extremities more than the upper. Vasomotor affections, as coldness and blueness of the feet, were mentioned in nineteen cases. Sensory symptoms are noted rather by their insignificance. Pain of some sort, usually slight, as an early symptom, occurred in twenty-two cases, and is stated as positively absent in seventy-nine cases. The lancinating pain of tabes is absent. Cutaneous sensibility is at times diminished (forty-seven cases), rarely increased. The diminution is usually slight, though occasionally well-marked. Paræsthesiæ are rare, the girdle sensation being referred to in but eight cases. In one hundred and seven cases speech was affected, a jerky, moderately rapid articulation, interrupted by sudden and irregular pauses, often between the syllables. Fibrillary tremor of the tongue

occurred in twenty-four cases. Mastication and deglutition are rarely affected. The face is often expressionless. Strabismus is reported in eight cases; diplegia and blepharospasm in a few cases, partial atrophy of the facial nerve in two cases. The pupillary reflexes were always present. Nystagmus occurred in fifty-six cases, usually ataxic nystagmus (appearing when the eyes are fixed upon an object). Static nystagmus is mentioned in but three instances, vertigo is not infrequent (twenty-nine cases). The intellect was probably weakened in twenty-one cases. The causal relationship is doubtful. There were affections of the bladder in thirteen cases, of the rectum in four, of menstruation in ten, impotence in three, palpitation in ten, gastric disturbances in nine, dyspnoea in five, persistent acceleration of the heart in eighteen, profuse sweating in three, and some other, probably accidental, symptoms. Autopsies have been made in twelve cases, of which five were made by Friedreich. The posterior nerve-roots were diseased in all the cases, the anterior roots in one case. There was sclerosis of the posterior columns in all the cases, sometimes more complete above than below, usually uniform throughout. The lateral pyramidal tracts were sclerosed in eleven cases. A narrow strip of normal tissue existed between the diseased portion and the posterior horn in seven cases. The direct cerebellar tract was involved in seven cases, a zone of degeneration extending forward of this in five cases. Clark's column was certainly affected in eight cases, probably in nine. Inflammation in and around the central canal occurred in four cases, and supplementary canals in three cases. The brain was normal. The pons and medulla were small in one case; the cord smaller than normal in eleven cases. Sclerosis extended to the medulla in five cases. The ependyma of the fourth ventricle was thickened in two cases. The author regards the disease as intermediate, clinically, between posterior spinal sclerosis and disseminated sclerosis, or the former and ataxic paraplegia. The smallness of the cord and the early age at which the disease develops renders it probable that under hereditary predisposition an arrest of development of central parts of the nervous system occurs during fetal life, producing a combined systematic degeneration. The chief diagnostic signs are: Evidence of hereditary influence, the occurrence of several cases in a family, early age of development, motor ataxia, static ataxia, affections of

speech, nystagmus, talipes, curvature of the spine, some degree of paralysis; furthermore, the absence of the knee-jerk, of marked sensory symptoms, trophic, vasomotor, and visceral affections, of atrophy of the optic nerves, and of affections of the intellect. The disease is slowly progressive, and treatment is of little avail.

Ormerod⁴⁷_{Jan.} reports three new typical cases, two in one family, their mother having an affection of the spinal cord resembling in some respects Friedreich's disease, in other a myelitis. Joffroy¹⁴_{Feb. 25} also reports a new case. Wells, of Indiana,⁵⁶_{Aug.} reports five cases with anomalous symptoms. Charcot¹⁷⁷_{Aug. 6} gives a clinical lecture upon a case. Dalché⁷³_{June 30} reports a doubtful case. Paul Blocq¹⁵²_{Apr. 28} reports two typical cases.

AMYOTROPHIC LATERAL SCLEROSIS.

Giacomo Lumbroso^{376 319}_{May; Nov. 3} reports the case of a male, aged thirty-nine, whose symptoms began a year previous with intermittent pain in the left shoulder, paresis of the corresponding arm, and slight dragging of the left leg. Later, the right side became similarly involved. He finally developed, in addition, bulbar symptoms, paresis and contracture in the lower facial distribution, atrophy of the left half of the tongue, and overflow of saliva. Sensation and the special senses remained normal, also the ocular movements. The brachial plexus and nerve-trunks in the arms were painful to pressure. The deltoid, extensors of the forearm, interossei, muscles of the thenar and hypothenar groups were atrophied, rigid, and painful under passive movement, exhibiting exaggerated reflexes and idio-muscular excitability. The pectorals and abdominal muscles were also atrophic and contracted. The lower extremities were rigid and paretic, but less so than the upper extremities. The knee-jerk was exaggerated. Reaction of degeneration was found in the atrophied muscles. The autopsy revealed amyotrophic lateral sclerosis, chiefly evident in the cervical region, invading the anterior horns, antero-lateral region, and to a less degree the direct and crossed pyramidal tracts. The changes diminished from above downward, being limited in the lumbar region to the anterior horns, with very slight invasion of the antero-lateral tract. Clark's column was only very slightly involved, and the columns of Goll were normal. The usual lesions of the pyramidal tracts and nerve nuclei were found in the medulla.

Granule cells were found in the pons, internal capsule, and white substance below the cortical motor areas; also in the cortex of the precentral region. The internal capsule exhibited some degenerated fibres.

W. R. B.

PARALYZING VERTIGO.

A *résumé* of this new disease (?) was prepared for last year's ANNUAL, but was accidentally lost. What follows is an abstract of papers on the subject published in 1887. The original paper was by Gerlier, of Ferney, ¹⁹⁷_{Jan. 13, '87} hence the name, "Gerlier's disease." His observations were quickly corroborated by a neighboring physician, David, ¹¹⁷_{Nov. 2} and a number of cases were observed by other practitioners around and in Geneva.

Sceniology.—The disease manifested itself only during the summer months in a restricted part of the Geneva Canton and in adjacent villages on French territory (chiefly at Collex, Ferney, Ornex, Macconex, Magroy, Colovrex, Genthod, etc.). It affected exclusively farm-hands, especially the cowherds and milkers. It is a paroxysmal disease, consisting of attacks occurring once or many times a day, always in the day-time. Its principal symptoms were, ptosis, vertigo, paresis of various muscular groups, more especially those of the neck and forearms, the extensors being more affected. The ptosis came on suddenly, as a rule, giving the patient a stupid or somnolent expression; often it was necessary for patients to hold up their eyelids to find their way. At the same time giddiness was present, rarely true vertigo; the head hung forward on the breast, the walk was feeble, or patients even dropped down, or more often let go of objects held in hand. If attacked while doing anything (milking, etc.), the paresis became so pronounced that the task could not be accomplished; if while walking, the patient was obliged to sit or lie down. Another symptom of the early stage of the attack was severe pain in the back of the neck, extending into the occiput. No sensory disturbances, except occasionally "numbness" of a limb, were observed, nor were any ocular symptoms noted during attack except the ptosis; the reflexes were normal; intelligence fully preserved. No fever or impairment of health noted; patients were attacked while in good health. Attacks seldom lasted more than ten minutes, incomplete ones often less. Movement of patient, of objects around him, use of hands, would

bring on relapses. These could also be produced by making patient look fixedly at a brilliant object. Rest, and especially change of residence, interrupted the attacks for long periods, but a relapse was probable on return to habitation and work.

The ocular symptoms in nine cases, several of them observed by Gerlier and other physicians named, were noted, though very imperfectly, by Haltenhoff, ⁷³_{June 25} an oculist of Geneva. He was able to observe the partial ptosis, bilateral but not always equal, in eight cases. In several, vision was reduced, but the causes of this are not sufficiently studied. Accommodation was diminished in two cases. In one well-marked case vision was normal. In no case was any ophthalmoscopic lesion found. Consequently it would appear that the ocular symptoms of Gerlier's disease are restricted to muscles supplied by the motor oculi nerves. The *differential diagnosis* presents no difficulty, as the three cardinal symptoms, ptosis, muscular weakness or paresis, and cervico-occipital pain, do not present themselves in the paroxysms of any other known disease or symptom-group. Vertiginous epilepsy, Ménière's vertigo, milkers' cramp, ordinary intermittent paralysis, vertigo due to gastric disorder, are easily excluded.

Pathology and Etiology.—The influence of sex is well marked. All of Gerlier's ten cases in 1886 were males, and he heard of only one female affected. The farm-hands are usually the victims, and landowners are affected only when they do the manual labor themselves. It is pre-eminently a home disease, located in certain farm-houses and stables. Overwork seemed an important cause, as the subjects were at work from 3 A.M. to 8 P.M., and on Sundays "amused themselves" instead of resting. Age was of no importance, the subjects ranging from eighteen to fifty-five years. The influence of seasons is most marked, the disease flourishing in July, August, and September, and died out before December. The attacks are always diurnal. Insolation, together with overwork, was the most important exciting cause of attacks. Gerlier carefully investigated the food and drink of the inhabitants of the farms where the disease occurred, and reached the conclusion that in none of these was the toxic agent to be found. Alcoholic and venereal excesses appeared only as predisposing causes. Moral or hysterical contagion was absolutely excluded.

In a subsequent article ¹⁶⁷_{May 15} the author makes a further study

of the probable source of the disease, and reaches the conclusion that it is a stable miasm, probably microbic in nature, which flourishes during the warm season, and may occasionally be revived in a cooler season by the rather high temperature of the stables.

The animals remained healthy, and if the yield of milk was greatly reduced on the farm it was because the cows were badly and incompletely milked.

It is stated that the remedy which seemed to exert the most positive action on the disease was iodide of potassium, but as the author gave only four grains (!) (0.26 gramme) *per diem* this statement cannot be accepted. Cold baths, from fifteen to twenty-five minutes in water of 66° to 72° F. (19° to 22° C.), were beneficial, as was also the sulphate of quinia. By far the most efficacious remedy, however, was change of residence, *i.e.*, leaving the stable and its vicinity. Gerlier proposes measures of ventilation and drainage of the stables, and more especially the separation of the farm-hands sleeping from the stable, as prophylactic measures.

Prognosis.—No fatal case has occurred, and the disease seems in nowise dangerous. Recovery follows quickly and is permanent if the patient be removed from the state of intoxication.

I would call attention to the remarkable similarity between the symptoms of Gerlier's disease and those of poisoning by conium maculatum: third-nerve paresis, paresis of arms and legs, vertigo and staggering. Pain in the back of the neck and flexion of the head or the chest are, however, symptoms which he has not observed in patients rendered paretic by full doses, fifty to one hundred minims (3.24 to 6.48 grammes), of Squibb's fluid extract of conium.

E. C. S.

PERIPHERAL NERVOUS DISEASES AND GENERAL NEUROSES.

By HENRY HUN, M.D.,

ALBANY.

NEURITIS.

WITH the exception of Remak's most valuable summary¹⁰⁰⁰ of the whole subject of neuritis, nothing of unusual interest has been published during the past year on the inflammations and degenerations of single nerves, as distinguished from multiple neuritis. Pitres and Vaillard,³_{June 29} who have previously experimentally studied the effects of injections of ether in the neighborhood of nerve-trunks, as described in the last ANNUAL, vol. i, p. 141, have extended their researches to the effects of similar injections of alcohol, and find that the portion of the nerve with which the alcohol comes in contact undergoes necrosis, and that below this point the nerve degenerates, regeneration commencing on the fortieth day when pure alcohol, and on the twenty-fifth or thirtieth day when 50 per cent. alcohol, is injected. The injection is followed by paralysis of motion and sensation and frequently by trophic lesions in the domain of the injured nerve. When the alcohol is diluted to 25 per cent. the necrosis is less manifest and phenomena of irritation seem to predominate, while the immediate effects of the injection consist rather in a simple diminution of the functional activity of the nerve than in a true paralysis. Alcohols of the higher series, amylic, propylic, etc., act more strongly than ethylic and methylic alcohol. This action of alcohol and ether must be taken into account when neuralgias are treated by deep injections near the nerve-trunks, and, indeed, Falkenheim⁶⁵¹_{p.132} reports two cases in which paralysis resulted from the injection of ether for the relief of heart failure, the ether having been injected in the neighborhood of the nerve that was paralyzed.

Hoffmann⁷⁵_{May 1} reports an interesting case of that rare affection, isolated paralysis of the supra- and infra- spinatus muscles, which was apparently due to a rheumatic neuritis of the left suprascapular

nerve. Alamartine²²⁸_{Sept. 15, '88} reports two cases of paralysis and atrophy of the muscles of an arm, which were apparently the result, in the one case of a rheumatic arthritis of a metacarpal joint, in the other of a wound of the hand by a fragment of hot iron. He considers these cases to be examples of "reflex muscular atrophy," but it seems more probable that they are examples of a neuritis. Giuffrè⁶⁵²_{v. 3, '87} describes a well-observed case of neuritis of the left brachial plexus following a fall on the left shoulder. The deltoid, the biceps, the brachialis anticus, and both supinator muscles were paralyzed and atrophied, which indicated, when taken in connection with the other symptoms, that the neuritis affected the fifth and sixth cervical nerve-trunks. Recovery took place in two months. Hadden⁶_{Apr. 7} reports a somewhat similar case. Leszynsky²⁴²_{May} reports a case of idiopathic neuritis of the brachial plexus, causing a painful and wasting paralysis of the muscles of the right shoulder, associated with the electrical reaction of degeneration and with cutaneous anaesthesia, and which was followed at an interval of several years by a similar attack involving the muscles of the left shoulder. Bundy⁶⁰_{Jan. 7} describes a case of severe neuritis of the brachial plexus of the right arm, which, as it improved, was followed by a milder attack of neuritis in the left brachial plexus, which yielded to quinia and potassium iodide. Dubois²¹⁴_{No. 14} reports two cases of neuritis with very abrupt onset.

Grady⁵⁹_{April 14} reports the very interesting case of a healthy girl who suffered from successive paresis of the third, fourth, and sixth nerves of one side, after an interval of six weeks from an optic neuritis of the same side, and after a further interval of three months from a paresis of both branches of the seventh nerve of the opposite side. Unverricht⁵⁴_{Dec. 15, '87} reports a case where all the cranial nerves, one after another, were affected by minute sarcomatous metastases between the dura mater and calvaria. He also mentions four other cases of multiple cranial neuritis, all of which were of syphilitic origin. Bernhardt⁴_{No. 19} considers that those cases of facial paralysis which are preceded by pain are not more severe than cases which do not present this symptom; and he also considers, in opposition to Neumann⁹¹_{May, '88} that heredity plays a very subordinate rôle in the ordinary cases of rheumatic facial paralysis. Stephan⁹²_{July} reports a case of congenital facial paralysis which was due neither to the pressure of forceps nor to a tedious labor (the

usual causes in such cases), but probably to some intra-uterine disease, since it was associated with deafness on the same side. He finds only one similar case in medical literature, that of Henoch,¹⁰²⁹ Demoulin⁵⁵_{July 7} in an interesting paper on "Facial Paralysis Following, at an Interval, Fractures of the Petrous Portion of the Temporal Bone," draws the following conclusions: Facial paralysis consecutive to fractures of the petrous portion of the temporal bone may develop slowly, in which case it is due to compression of the nerve in consequence of the swelling of the periosteum lining the Fallopian canal, and of the swelling of the congested facial nerve. This form of facial paralysis is always flaccid, its prognosis is always favorable, and as soon as it appears the diagnosis of fracture of the petrous portion of the temporal bone is made certain. Ferrier⁶_{Jan. 7} reports an interesting case of paralysis of the fifth cranial nerve which confirms our present ideas as to the function of that nerve. Potain¹⁰⁰_{Oct. 31} reports a number of cases in which pains in the arms, due either to neuromata following amputations or to probable neuritis following injuries, have been associated with cardialgia, palpitation, and decided enlargement of the area of cardiac dullness. All these symptoms have disappeared after removal of the neuromata or after galvanization of the brachial plexus, and Potain considers them to be of a reflex nature due to traumatism of some branch of the brachial plexus.

Pressure Paralysis.—Beevor²_{July 25, '87} reports a very interesting case of a woman, aged thirty-six, who slept for five hours with her head lying on a table and her neck pressed strongly against the corner of the table. On awakening the arm was "asleep," the thumb, fingers, and wrist could be moved, but flexion and rotation of the forearm and ab- and ad-duction at the shoulder were impossible. Five days later, examination revealed slight anaesthesia of the thumb and of a large area about the shoulder-joint and on the breast. The pressure of the corner of the table had acted at a point two and a half inches above the clavicle on the posterior border of the sterno-cleido-mastoid muscle. The supinator longus and brevis, the biceps, the brachialis anticus, the deltoid, the supra- and infra-spinatus, the teres minor muscles, and the clavicular portion of the pectoralis major muscle were paralyzed; the trapezius, rhomboidei, teres major, and subscapularis muscles were parietic, no other muscles being affected. The faradic excitability was lost

in the supinator muscles and diminished in the other paralyzed muscles. At the end of three months the anaesthesia slowly disappeared, followed by a gradual return of voluntary power over the muscles, but at the end of seven months abduction of the humerus was still feeble. Beever claims that no such case has ever been reported in England, and in no case was the point of pressure so sharply defined, since the sharp corner of the table had pressed exclusively on the fifth and sixth cervical nerve-trunks. Marchand³⁹_{July 14, Aug. 11} and Terrillon⁹¹_{June 10} each report cases of paralysis due to pressure on a nerve from a bony callus, the result of a fracture, and in each case when the nerve was freed from the pressure of the callus by a surgical operation the paralysis slowly disappeared. Bernhardt²⁰⁸_{Feb. 19, H 2} and Putnam⁹⁹_{Aug. 2} report interesting cases of pressure paralyses. Starr²¹²_{July} publishes an interesting clinical lecture on "confinement paralysis." Morison²_{July 14} reports a case of traumatic paralysis of the right hypoglossus nerve due to a jar and strain of the neck received in jumping, and causing paralysis and atrophy of the right half of the tongue.

Remak¹_{Feb. 13} describes a case in which, on account of a tumor which was adherent to it, five or six centimetres (two and one-half inches) of the upper part of the right cervical sympathetic nerve, together with the superior cervical ganglion, was extirpated, and in the operation the hypoglossus and the spinal accessory nerves were injured. In consequence of the injury to the sympathetic nerve there was a contraction of the right pupil, a slight ptosis on right side (due to the paralysis of the unstriated muscular fibres of the eyelid discovered by H. Müller), a redness of the right ear with objective elevation of temperature and subjective sensation of cold, and a diminished secretion of sweat and an increased secretion of saliva on the right side. In consequence of the injury to the hypoglossus nerve there was a paralysis of the right genioglossus muscle. In consequence of the injury to the accessory nerve there was a paralysis of the sterno-cleido-mastoid and trapezoid muscles and of the crico-arytenoideus posticus muscle in the larynx.

MULTIPLE NEURITIS.

Numerous publications during the year show the interest with which multiple neuritis is being studied in all parts of the world. Leyden, who first in 1880 drew a clear clinical picture of this dis-

ease and established it on a firm anatomical basis, has published a brochure,¹⁰³⁰ consisting of two lectures, which demands an extended abstract in virtue of its great interest and value. He first traces the historical development of our knowledge of polyneuritis, and draws with great skill a clear clinical picture of the disease, calling especial attention to the sensory symptoms, the tenderness of the nerves and muscles corresponding to the inflammatory processes, the subjective hyperæsthesia (shooting, burning, cutting pains increased by every movement), the numbness of the fingers and toes, as well as painful sensations as if the limb were "going to sleep," and the trophic and vaso-motor symptoms, among which is often extensive painful œdema. There early appears a striking progressive weakness which soon develops into an evident bilateral paralysis, manifesting itself first in the fingers and toes, extending, often very rapidly, to the other muscles of the extremities, and reaching the trunk similarly to Landry's paralysis. The paralysis is followed by muscular atrophy. Among the rarer symptoms he mentions involvement of the facial nerve and of the eye-muscles (strabismus, nystagmus, contracted and even immobile pupil), disturbances in the function of the bladder and rectum (whereby the resemblance to disease of the spinal cord is increased, although it appears that in these cases there is an affection of the peripheral nerves supplied to the muscles of the bladder and rectum), delirium, conditions of mental excitement, insomnia, rapid pulse, and signs of cardiac weakness. The development of the disease is either acute or subacute, and its course and duration are very variable. There are cases which run a very acute course and terminate either in death or recovery, but the majority of the cases have a duration of weeks or months, or even years in rare cases, and after its termination there often remain certain symptoms, such as slight weakness, paræsthesia, palpitation, nervousness, etc. There are also atypical, irregular cases of multiple neuritis, in which only a few nerves are involved, and sometimes one nerve is alone affected.

In regard to the pathological anatomy of the disease, Leyden states that in all cases there are in a number of the peripheral nerves degenerative processes entirely independent of any disease of the spinal cord. This degeneration is found in the smaller nerve-branches, the larger nerve-trunks and the spinal nerve-roots being usually entirely healthy. The alterations in the structure of the

nerves are not always the same, being in some cases of an inflammatory, in others of a simple degenerative, nature. It is, then, theoretically possible to separate multiple neuritis from multiple degeneration or atrophy, but it is not possible to separate these two classes sharply, either anatomically or clinically.

According as the disease attacks exclusively or mainly the motor or the sensory nerve-fibres, a motor and a sensory variety can be distinguished; usually there is a mixture of the two. The sensory variety can be subdivided into two groups—the acute or subacute form, which embraces the typical multiple neuritis, and the chronic-atrophic or sclerotic form. In the motor variety of multiple neuritis the muscular paralysis and atrophy are the prominent symptoms (motor, paralytic, or amyotrophic variety); in the sensory variety the sensory symptoms are the prominent ones, and the motor disturbances are manifested rather in the form of ataxia than in that of paralysis (sensory or ataxic form, pseudo-tabes, *nervo-tabes peripherica*). Whether acute ascending (Landry's) paralysis is an example of multiple neuritis Leyden considers as yet unproven but as probable.

The author points out that multiple neuritis is not a simple disease, but a group of diseases, the component members of which present many individual differences, an accurate knowledge of which is necessary for a proper comprehension of the prognosis and treatment of each individual case. He considers that a division of the different members of the group on a pathological anatomical basis is impracticable, and proposes a classification on an etiological basis as follows: 1, the infectious form; 2, the toxic form (lead, alcohol, arsenic, phosphorus); 3, the spontaneous form (rheumatism and overexertion); 4, the atrophic form (dyscrasic and cachectic); 5, the sensible form (pseudo-tabes or *nervo-tabes peripherica*).

1. The infectious form follows the acute infectious diseases, such as diphtheria, typhoid fever, small-pox, scarlet fever, and measles, also pneumonia, pleurisy, septicaemia, and erysipelas. Syphilis is also a direct cause of multiple neuritis, but the multiple neuritis following tuberculosis is considered by Leyden to be due not to any chemical poison produced by the tubercle bacillus, but to the cachexia and atrophy which tuberculosis causes. Kakke (*beri-beri*) must be classed among the infectious forms of

multiple neuritis. He considers that the majority of the paralyzes observed after acute diseases are due to multiple neuritis, although he does not deny the occurrence of spinal affections following acute disease. The infectious form generally runs a favorable course and is usually of the motor, although not uncommonly of the sensory, variety. The infectious form of multiple neuritis is not directly due to an organized virus, but to a chemical poison (ptomaine) produced in the body by bacterial life. It is possible that this chemical poison may unite with some constituent of the peripheral nerves and thereby cause a trophic degeneration or an irritation exciting inflammation. The same process may, perhaps, take place in the toxic form.

2. The toxic form consists of the following varieties:—

(a) Lead palsy, characterized by its localization in the extensor muscles of the forearm and by the rapidly appearing and absolutely irreparable degeneration. In those rare cases in which the lead palsy is more general, extending even to the muscles of the shoulder and trunk, lesions are found in the spinal cord—a proof that no absolute line can be drawn between the affections of the peripheral nerves and those of the spinal cord. (b) Phosphorus and arsenical paralysis, which attack especially the lower extremities, commence with pain, result in numbness and muscular weakness, and rarely exhibit decided atrophy. (c) Paralysis from carbonic oxide, carbon sulphide, anilin and ergot. (d) Mercurial paralysis, which is not uncommon both in the acute and chronic forms of mercurial poisoning and which occurs in the form of paralysis with relaxation, rarely complete, rarely accompanied by decided atrophy, and associated with diminution of sensibility at certain points and hyperæsthesia at others. (e) Paralysis in experimental neuritis, caused by the injection of toxic substances, such as ether, chloroform, alcohol, ammonia, plumbic acetate, etc. (f) Alcoholic neuritis, which often begins in an attack of delirium tremens. The lower extremities are always attacked and almost invariably recovery takes place at the end of several months. Exclusive of the alcoholic tremor, the cause of which is unknown, three varieties of alcoholic neuritis are to be distinguished—the paralytic (with predominating motor symptoms), the ataxic, and the hyperæsthetic or neuralgic (the last two presenting predominating sensory symptoms). The ataxic form can resemble loco-

motor ataxia very closely, exhibiting at times double vision, inequality, sluggish reaction, or even immobility of the pupils, Romberg's and Westphal's symptoms, and, nevertheless, is due to a neuritis and can be recognized as a neuritis only by its etiology (alcoholism) and by its favorable course, ending in recovery. The hyperæsthetic form is characterized by pain, usually in the lower extremities, and may be associated with muscular weakness and disturbances of sensibility. Alcoholic neuritis is not rarely associated with cardiac symptoms (tachycardia, palpitation, dyspnœa, asthma, cardiac weakness).

3. The spontaneous or primary form is not preceded by any other disease, is usually due to exposure to cold or to overexertion or both, usually attacks all four extremities symmetrically, and is usually of the motor, more rarely of the sensory, variety.

4. The atrophic, anæmic, cachectic form, occurring in cases of anæmia, pernicious anæmia, chlorosis, cachexia, marasmus, cancer, diabetes, tuberculosis, kakke, has been the least studied, although it has long been known that in chronic diseases the lower extremities often become weak. Of late Oppenheim and Siemerling have thrown light on this subject by showing that chronic and severe wasting diseases are associated with a very considerable degeneration of the peripheral nerves. Among these wasting diseases must be reckoned diabetes mellitus, and Leyden divides the diabetic, just as the alcoholic, neuritis into three classes, the paralytic, the ataxic (pseudo-tabes of diabetics), and the hyperæsthetic or neuralgic. The diabetic neuritis can hardly be due directly to the excess of sugar in the blood, but is one symptom of the diabetic marasmus. The prognosis is not unfavorable.

5. The sensible form occurs in two varieties: (*a*) the acute or subacute form, to which class belong the cases of acute ataxia, especially those occurring after infectious diseases or as the result of poisoning; (*b*) the chronic form, to which class belong the diseases of the peripheral nerves in cases of locomotor ataxia.

Leyden discusses those cases of locomotor ataxia in which the peripheral nerves are degenerated, as has been described by Westphal, Déjerine, and others, which suggests the question of the peripheral origin of locomotor ataxia. "For many cases it is hardly possible to dismiss the thought that for years the process has existed only in the periphery of the nerves." The transition

of an acute sensory neuritis (ataxia) to an involvement of the spinal cord is not yet proved, "but the possibility of this must be borne in mind." He recommends, in the main, a hygienic-expectant form of treatment. The principal indications are absolute rest and an invigorating diet, especially in the stage of regeneration. Great attention should be paid to the etiological and symptomatic treatment, and among all medicines salicylic acid or sodium salicylate is the most important, especially in the early stages and in the rheumatic form of the disease; while antipyrin, potassium iodide and bromide, and colchicum are also of value. He advises strongly against the too early use of electricity or of active and passive muscular exercise; in the latter stages electricity is of value principally to give information in regard to the de- and regenerative processes taking place in the nerves.

Bampton,⁶_{Mar. 10} Bruzelius,³⁷¹₈₇ Vaughan,²²_{Aug. 8} Cornelius,¹⁰³¹ Smart,³⁴_{July} Massey,¹⁹_{Apr. 28} and Hardman²⁰⁷_{Oct.} have reported cases of multiple neuritis which confirm, without adding anything material to, the symptoms of the disease as given by Leyden. Fitzsimmons,¹⁰⁵_{Mar. 25} gives a summary of the disease without reporting any cases, and Minkowski,⁴¹_{Nov. 1} gives a valuable and interesting summary of the subject, based on twenty cases of his own.

Strümpell,³⁴_{July 21} reports two unusual cases of multiple neuritis. The first case commenced with a complete bilateral facial paralysis, soon followed by weakness of the arms, ataxia of the legs, and general neuralgic pains in the face and extremities. The second case commenced with pains and weakness of the arms, followed in three weeks by pains in the legs and a paralysis which was remarkable in that it involved especially the gluteal muscles and the flexors of the legs (biceps, semimembranosus, and semitendinosus).

Jollye,¹³¹_{Mar.} describes an interesting case of multiple neuritis commencing with pleurodynia, in addition to pains and muscular spasms in the legs, and which ran a very typical course, but presented a symptom to which he calls especial attention, viz.: painless retention of urine, the bladder being greatly distended without causing any discomfort to the patient, who, until a year before the disease manifested itself, had been accustomed to take rather more beer than was good for him and had had several attacks of gout; and on this rather insufficient basis Jollye calls

the disease gouty peripheral neuritis. Desnos³_{Nov. 28} reports a case of general muscular paralysis and atrophy, probably due to a multiple neuritis, which made its appearance in the fourth month of pregnancy.

Infectious Multiple Neuritis.—A number of cases of this form of multiple neuritis have been reported. Eisenlohr⁴_{No. 42, '87} mentions an epidemic of nine cases occurring in Hamburg between September, 1886, and February, 1887 (three cases in September, two each in October and November, and one each in December and February), and considers the question whether this epidemic may not have some connection with the epidemics of cerebro-spinal meningitis which have occurred so frequently in Hamburg of late years. [Compare Mills, ANNUAL, issue of 1888, vol. i, p. 118.] At the end of his article he calls attention to the fact that cases of trichina poisoning in certain stages are very difficult to diagnose from multiple neuritis. Löwenfeld³¹_{Sept. 4, 11} argues, on theoretical grounds, that there is an infectious form of multiple neuritis, and cites three cases in proof. One of these seems to be a diphtheritic paralysis, in which there is no history of diphtheria, and he uses it in support of his view that pathogenic bacteria in certain cases, instead of producing the corresponding disease, may directly, or after certain prodromal symptoms, cause extensive inflammatory or degenerative changes in the peripheral nerves. From another, in which the multiple neuritis commenced in an attack of acute rheumatism, he draws the deduction that the microbes of articular rheumatism can also cause a primary infectious multiple neuritis. His paper is a most interesting and valuable one, but it is rather in the line of an ingenious argument than of scientific proof. D'Abundo⁵⁸⁹_{Aug. '97} has injected into the sheath of nerves of rabbits and dogs pure cultures of Friedländer's micrococcus of pneumonia and also of the bacillus of typhoid fever; in the former case always, in the latter case usually, the injections were followed by functional disturbances in the region of their distribution and sometimes by anatomical changes in the nerves. Although, as a result of fifteen experiments, he finds that the injection of sterilized culture mediums into the sheath of nerves gives rise neither to functional nor to organic disturbance, yet in the light of Pitres' and Vaillard's experiments and of Rosenheim's case, referred to below, we must hesitate to accept the conclusion that multiple

neuritis following the infectious diseases is due to the direct action of micro-organisms on the nerves.

Rosenheim³⁶⁸_{Bd.18, H.3} reports a well-observed and accurately reported case of neuritis multiplex infectiosa acuta in a thirty-five-year-old tuberculous coachman which terminated fatally in seventeen days, after having presented all the typical symptoms of multiple neuritis. There is only one case analogous to this in medical literature, namely, that reported²⁰_{Bd.79} by Eichorst. At the autopsy, in addition to a tuberculosis of the left lung, there was found extensive alteration in the large nerve-trunks, not only of the nerves of the extremities, but also of the pneumogastric nerve, while the brain and spinal cord were normal. In the interstitial tissue of the nerves there was an inflammatory process characterized by hyperæmia, hæmorrhage, and proliferation of the nuclei; the parenchyma of the nerves was involved to a moderate degree by degeneration and atrophy of the medullary substance and finally by disappearance of the axis cylinder. In the endoneurium there was a very decided increase in the number of granular cells ("mastzellen"). [Rosenheim has previously³⁶⁸₅₀ called attention to the significance of these granular cells in this situation.] He examined with great care the most severely diseased portions of the nerves for bacteria. In spite of entirely negative results, on account of the peculiar course of the disease, he considers it of an infectious nature and due to some chemical poison produced by the growth of the bacilli tuberculosis in the left lung. Browning¹⁵⁷_{Jan.} reports a most interesting case of multiple neuritis following and apparently caused by an attack of facial erysipelas. Lanz³⁶⁸_{Bd.18, p.291} describes a case of multiple neuritis following typhus fever, and Handford¹⁷_{July} reports three very interesting cases of typhoid fever in the course of which a neuritis of the ulnar nerve of one arm developed. Two of these cases lay for days together "curled up" with the elbows sharply flexed; so that it is possible that the neuritis was due to overextension of the ulnar nerve, as has been suggested by Gowers; but in the third case this cause was not in operation. He thinks that, "on the whole, there is evidence that traumatism plays a part in the etiology of these cases, though probably tissue malnutrition may be an essential condition."

Lachkiévitch⁶⁷³_{Nos.9, 16} reports a case of chronic syphilitic multiple

neuritis which he believes is very rare, almost unique. No case has ever been described in which the paralysis was so extensive as in this woman, aged forty-seven, in whom all four extremities were paralyzed, the rectum and bladder not being involved and the cutaneous sensibility intact. The reflexes were abolished, the muscles atrophied, and some of them exhibited the reaction of degeneration. Under antisiphilitic treatment the patient made great improvement, although she did not entirely regain her strength.

Thompson⁹⁹_{June 14} publishes an article on diphtheritic paralysis in which he considers that the cause is a degeneration of the peripheral nerves or a parenchymatous neuritis; he regards the latter, however, as not being a true neuritis at all, and reserves the term for the interstitial form. In a later article⁹⁹_{Dec. 15} he reports a number of cases which he considers examples of parenchymatous neuritis and again states his belief that this parenchymatous neuritis is not a true neuritis at all. Indeed, he states that he knows of no changes within the sheath of Schwann which can be called inflammatory. In connection with these views I would call attention to the statement of Leyden, "that it is theoretically possible to separate multiple neuritis from multiple degeneration or atrophy, but it is not possible to separate these two classes sharply either anatomically or clinically."

Toric Multiple Neuritis.—A number of cases have been reported. Goldflam¹¹¹_{Oct. 14, 1914} cites the case of a man, aged thirty-one, who took an overdose of arsenic, which immediately caused severe and continuous vomiting, followed in three days by a temporary difficulty in deglutition and accompanied by great restlessness and palpitation. In the course of the second week he had so far recovered as to leave his bed and give his attention to business, although he felt weak. At the end of the second week stiffness, weakness, and hyperæsthesia appeared in the arms and legs, and gradually all the symptoms of a multiple neuritis came on, and in the course of two and a half months attained an extreme degree of development. Under the employment of faradization, baths, and potassium iodide the patient improved, and six months after the poisoning he was able to walk in the street, to write, and was nearly well again. He reports this case in connection with two others, those of a man and wife, both of whom suffered from multiple neuritis. The wife was affected much more severely than

her husband, and after recovering from her first attack she had a relapse, which very rarely happens in multiple neuritis. The fact that the disease thus occurred in both husband and wife indicates that both cases were the result of a common cause. Goldflam discusses at great length and rejects all the possible causes, but his reasons for rejecting chronic arsenical poisoning (both husband and wife, in their occupation in a bookbindery, handled colored paper containing arsenic) do not seem altogether conclusive, and, considering the prominence of gastric disturbance and the frequent attacks of œdema of the face and feet in the course of the disease, it seems not impossible that arsenical poisoning may have been the cause of the neuritis. Falkenheim,⁶⁵¹ Putzel,⁵⁹ and Peterson⁵⁹ report interesting cases of arsenical neuritis, and Wood,⁹ reports a case of arsenical neuritis which shows the value of persistent treatment, even in the most hopeless forms of the disease. In these cases the disease was caused by a single poisonous dose of arsenic, but Putnam⁹⁹ reports a very interesting case of multiple neuritis in which arsenic was found in the urine, the cause of the disease being probably five drops of Fowler's solution, taken three times a day for about six weeks just before the first manifestations of the disease.

M. A. Starr²⁴² publishes an interesting clinical lecture on "lead paralysis." Suckling² reports the case of a boy, aged fourteen, suffering from multiple peripheral neuritis who had worked in lead and zinc for eighteen months. A few weeks before the onset of his illness he had changed his occupation to that of stamping bolts, and while at this heavy work weakness gradually came on. On admission he complained of weakness in his hands and feet, all of which were "dropped," power of extension being lost. There was much weakness in the other muscles of the extremities. Anæsthesia was well marked in all four extremities, but was not complete, and extended only a few inches from the wrist and ankle-joints; the knee-jerk was abolished on both sides; the calf-muscles were tender on palpation. Faradic irritability was diminished, but the reaction of degeneration was not present. There was no blue line on the gums, nor had there been colic or constipation. The bladder and rectum were unaffected. Suckling considers that exposure to cold and hard work had been the exciting causes, but that his having worked on lead had predisposed to the affection.

Braun³²⁶_{No. 45} describes a peculiar case of combined disease of the spinal cord and of the peripheral nerves in a man seventy-four years of age. The patient handled much lead in his work, so that lead poisoning might well have been an etiological factor in the disease, which commenced with pains and paraesthesia in the right arm and hand and in both legs, and at the same time the muscles of the hand, the extensors of the forearm, and the muscles about the shoulder became atrophied, painful on pressure, exhibited fibrillary contractions, and showed a diminished electrical excitability and a partial reaction of degeneration. The tendon reflexes of the arms were abolished, those of the legs present. Sensibility was normal. These symptoms had continued unchanged during nine months, when the patient died of erysipelas. At the autopsy there was found atrophy and absence of the ganglion cells in the anterior horns and of the anterior nerve-roots on the right side at the level of the origin of the sixth and seventh cervical nerves, a bilateral atrophy of the posterior nerve-roots of the cervical and lumbar enlargements, and also a degeneration of the posterior columns (atrophy of the nerve-fibres, increase in the connective tissue) which diminished in extent from the lumbar enlargement. Both the peripheral nerves and the paralyzed muscles of the arms and legs were degenerated. Braun is inclined to think that in this case the starting point of the disease was a peripheral neuritis, in consequence of which there was a secondary degeneration of the nerves up to and involving the spinal cord, and that the lesions in the right anterior horn and in the posterior columns were due to the propagation of the disease along the continuation of the sensory channels in the spinal cord. Raymond³_{Jan. 13} reports a case of neuritis of both sciatic nerves occurring in the course of an interstitial nephritis in a man, aged fifty-seven, of alcoholic habits and exposed to lead poisoning. At the autopsy, in addition to the neuritis of the sciatic nerves, a leptomyelitis of the lumbar region of the cord was found. Supporting himself on this case, Raymond thinks that in a great number of the cases of so-called peripheral neuritis the spinal meninges are primarily affected and the peripheral nerves secondarily involved, and that the spinal lesion would be discovered were the cord more carefully examined. In a discussion on the case Rendu advanced the same views. Certainly, considering the number of competent observers who have failed to find any lesion of the

spinal cord or its membranes in cases of peripheral neuritis, these views seem unjustified.

Alcoholic Multiple Neuritis.—A number of interesting cases of alcoholic multiple neuritis have been reported by Witkowski,³⁶⁸ Drysdale,² Lloyd,⁹ and Fry⁸² and Charcot¹²² publishes an interesting clinical lecture on alcoholic neuritis. Buzzard⁶ reports a case in which the diagnosis was somewhat doubtful as between lead palsy and alcoholic neuritis. Not only were the extensor muscles of the arms paralyzed as in lead palsy, but the supinator longus muscle was also paralyzed; there was also paresis of the left internal thyro-arytenoid muscle and there had been paralysis of the legs, which had slowly disappeared. The man had been a heavy drinker, had had nothing to do with lead for eight years, and had no blue line, so that the probabilities were strongly in favor of its being a case of alcoholic multiple neuritis. Sharkey⁶ reports a case of alcoholic paralysis in which after death the phrenic, pneumogastric, and popliteal nerves exhibited intense inflammatory changes, and in which during life there was extreme and constant rapidity of cardiac action, dyspnoea in paroxysms, difficulty in getting food past the pharynx, and great feebleness of voice. In this case, however, in addition to the lesions in the nerves, there was also inflammatory softening in the lower cervical and dorsal regions of the cord.

Ord⁶ reports the case of a barmaid, aged twenty-four, who, in addition to well-marked symptoms of alcoholic cerebral disturbance, presented, when first seen, the signs of alcoholic paraplegia in a most typical form. She had already great loss of muscular power in the extremities, particularly in the legs. The muscles were wasted and relaxed, so that the foot, for instance, when the leg was shaken, shook like the distal blade of a flail. Muscular hyperalgia was strongly present and the reaction of degeneration was marked. The knee-jerk and other deep reflexes were entirely absent. Yet with all these indications of loss of tonicity, contracture was present from the first, the flexors being evidently less relaxed than the extensors, and the muscular hyperalgia preventing any passive restoration of the balance; so that finally tenotomy had to be resorted to. There was present a retinitis practically indistinguishable from albuminuric retinitis. The urine certainly presented no signs of acute nephritis. If any

renal disease was present, it must have been interstitial nephritis. The albumen discovered at any time was extremely small in quantity, there was no decisive alterations in the quantity or specific gravity of the urine, and no indications of renal disease could be discovered by the microscope. Yet there was very marked arterial tension and distinct enlargement of the left ventricle, associated with the changes in the heart sounds which are recognized as indicating considerable heart tension. All these, after lasting some months, passed away. The question arises whether the retinal changes were due to renal mischief, or were possibly due to a peripheral neuritis of alcoholic origin.

Suckling,^{5 June} stating that Buzzard has met with paralysis of the soft palate, of the face, and also of the external rectus oculi, and that Hadden has noticed nystagmus in alcoholic paralysis, describes a case under his care of chronic alcoholism with ophthalmoplegia externa and double optic neuritis. Patient, a male, aged fifty, had been drinking heavily for years; on admission was incoherent, memory very defective; he did not know where he was. He was unable to raise his eyelids, there being drooping of both lids. There was slight external strabismus of the right eye. He was unable to rotate his eyeballs either upward or downward, but could move them readily from side to side. Pupils were small, but responded to light and accommodation. There was a slight degree of optic neuritis in both eyes. Knee-jerk was absent on both sides, the plantar reflex increased. There was no paralysis of the legs or arms, but the calf-muscles and posterior tibial nerves were exquisitely tender. The patient was improving. Suckling gives an excellent description of the two varieties of the disease first suggested by Dreschfeld,⁴⁷ alcoholic ataxia and alcoholic paraplegia, and also corroborates his observation that a peculiar form of delirium is present in the subjects of alcoholic paralysis in that, although unable to move, they say that they have been out walking, often an impossible distance. The diagnosis of the disease is kept in view throughout the entire article, and at the end he states: "The medical man should ask himself, Is the case due to organic or functional causes? If organic, is it due to cerebral, spinal, or peripheral disease? The absence of the knee-jerk is alone sufficient to prove that the paralysis is not hysterical. In cerebral paralysis there are no electrical changes, sensation is usually

unaffected, rigidity and not flaccidity is present, with exaggeration and not abolition of the tendon reflexes. Muscular wasting is not marked, nor are trophic changes usually present." He then mentions the principal diagnostic points of difference between alcoholic neuritis and diseases of the spinal cord. Lilienfeld⁴¹_{June 7} reports a case of alcoholic multiple neuritis in which, in addition to the usual symptoms of the disease, there were present nodular thickenings of the tendons and fascia in the palm of the hands, and such a great enlargement of the epiphyses of the bones of the wrist, finger, and knee-joints that the joints could not be moved even passively. The patient improved, and in the course of several years made an almost complete recovery. Bramwell⁵_{June} reports a case of alcoholic paralysis which is peculiar and exceptional, inasmuch as myalgic pains and muscular tenderness were absent throughout its whole course, and there was very slight evidence of any affection of the cutaneous [tactile] sensibility until the period of convalescence, when marked hyperæsthesia of the skin of the lower extremities was developed. The case is also of interest because of the wide-spread distribution of the paralysis and the presence of well-marked nystagmus and paralytic weakness of the muscles of the eyeballs. Bramwell also describes minutely the changes found in the peripheral nerves in a case of diabetes mellitus, with perforating ulcer of the foot and with absence of knee-jerk, the clinical report²⁶_{May 2, '97} of which had previously been made by Dr. Price. He found only very slight changes either in the spinal cord or in the sciatic nerve. On the other hand, the posterior tibial and plantar nerves were extensively degenerated. The posterior tibial artery was in an advanced condition of atheroma, and at one part of its course was adherent to the posterior tibial nerve; and he is inclined to regard the degenerative changes in the nerve as due to a perineuritis at the point where the artery and nerve were adherent and to the pressure of inflammatory products upon the nerve-trunks.

Eichhorst²⁰_{Bd. 112, H. 2} reports the case of an habitual drunkard who died from alcoholic paralysis after six weeks' illness. The symptoms began with inco-ordination and then paralysis of the legs, followed by paralysis of the extensors of the wrist, with rapid wasting of the paralyzed muscles, tenderness of the muscles, some cutaneous anæsthesia, abolition of the reflexes, and ultimately

vesical and rectal paralysis. At the post-mortem examination no gross lesions could be seen in the nerve-centres. The brain was not examined microscopically. The cord showed some asymmetry in the anterior cornua and some recent hemorrhages in the gray matter in the dorsal region, with thickening of the blood-vessels—changes which did not suffice to explain the general paralysis. The spinal nerve-roots were found to be normal. The peroneal, tibial, and radial nerves, on the other hand, showed an extensive degenerative atrophy, with absence of axis cylinders and medullary substance in many of the fibres without the slightest change in the connective tissue of the nerve. Tracing the nerves to their peripheral terminations in the muscles, he found the lesions to be more advanced and complete there than in the nerve-trunks. Indeed, within a muscle there was not a single normal nerve-fibre. Nor were the lesions of these intra-muscular nerves limited to degeneration, as in the nerve-trunks, but each degenerated fibre was surrounded by numerous laminae of connective tissue produced from the endoneurium and perineurium. It would seem as if the existence of the degenerate nerve-substance had excited inflammatory changes around it. Another remarkable fact was that the muscular fibres did not exhibit the trophic changes usually met with in neuritis, although in the vicinity of the diseased nerve endings the muscular fibres were atrophied as a result of the pressure of the newly formed epineural connective tissue. He therefore proposes to term the condition "neuritis fascians," as denoting what he considers to be the essential feature of the change—viz.: the inflammation of the nerve-sheath and the extension therefrom to the interstitial connective tissue of the muscles. In many places this was hypertrophied, this condition apparently always starting from the epineural connective tissue. In a later stage this connection would not be obvious, but there would simply be a general increase of the connective tissue throughout the muscle, with consequent atrophy from pressure of the muscle-fibres. He points out that similar changes in muscles have been described by Fränkel in phthisis and by Eisenlohr in infantile paralysis, the former raising the question whether the ensheathing bands of connective tissue arose from the blood-vessels or the neurilemma. He does not infer that neuritis fascians is special to alcoholic paralysis, nor does he claim that it occurs in all cases of alcoholic paralysis. It

seems, however, from the criticism of Siemerling,³⁶⁸ that the appearances which Eichhorst describes under the name of neuritis fascians are identical with the structures described by Roth³⁶⁵ under the name of "neuro-muscular origin" (neuromuskulären stämmchen) in the voluntary muscles. Siemerling, as well as Roth, has found these structures in the muscles of perfectly healthy individuals (suicides and others) and considers them physiological rather than pathological.

Jappa, in a dissertation in Russian on the changes in the peripheral nerves in tuberculosis, gives the results of his examination of the peripheral nerves in fifteen cases of death from pulmonary tuberculosis in which during life there were no nervous symptoms, except indeterminate neuralgic and muscular pains, general hyperæsthesia, and exaggerated tendon reflexes—symptoms which are commonly observed in high febrile conditions and in the premortal inanition of consumptives. The microscopical examination showed that in every case these nerves contained a considerable number of diseased fibres, the changes affecting not only the axis cylinder and the medullary substance, but also the nuclei of the sheath of Schwann, and the author considers them examples of parenchymatous neuritis. The intensity of the process was greatest in the smaller nerve-branches and more marked in the nerves of the lower extremities than in those of the upper. The spinal cord was examined in twelve cases and found to be normal in all.

The muscular atrophy and paralysis associated with acute and chronic articular rheumatism will be discussed under Myositis.

BERI-BERI.

The subject of Beri-Beri was presented very fully in the last issue of the *ANNUAL* and there is very little to be added this year, and what has been published does not tend to strengthen the supposed identity of this disease with multiple neuritis. Miura^{20 Feb.} reports the results of fourteen autopsies. In the brain and spinal cord he finds nothing abnormal except the presence of vacuoles in the ganglion-cells of the spinal cord, and he is not inclined to attach much significance to them. In almost all of the cases there was cardiac hypertrophy and dilatation. The muscular tissue of the heart appeared usually normal, fatty degeneration was rare, but in

two cases there were many granular cells ("mastzellen") in the interstitial tissue of the heart-muscle. There were no characteristic changes in the lungs. In a number of cases the kidneys showed alterations in structure, usually in the form of glomerulo-nephritis. The liver usually was of the nutmeg variety, the spleen normal. The peripheral nerves were normal, but the muscles very commonly showed the "waxy degeneration" described by Zenker and also a multiplication of the nuclei of the sarcolemma and an increase in the connective tissue. Miura, in a later paper, ²⁰_{Nov. Dec.} explains the dilatation and hypertrophy of the right ventricle and the accentuated pulmonic second sound, so often present in cases of kakke, by an increased resistance in the pulmonary circulation due to paralysis of the diaphragm, and obtains relief in these cases by faradization of the phrenic nerve. Taylor ²³¹_{Apr.} gives a very good account of kakke, illustrated by sphygmographic tracings. He calls attention to the fact that failure of the circulation is, in this disease, almost invariably the immediate cause of death. Cousland ²³⁵_{June} reports an epidemic occurring in a school. Springthorpe ²⁸⁵_{Mar. 15} reports five cases of the disease; Thornton ¹⁰⁰_{Oct.} two cases of the disease cured by free purging, frequently repeated, and by citrate of iron and quinine as a tonic.

One of the most interesting contributions to the subject is that of Kynsey, ¹⁰⁶³²₉₇ in which he attempts to prove the identity of beri-beri, or anæmia of Ceylon, with the disease caused by the presence in the intestine of the parasitic worm, *ankylostomum duodenale*. It is shown that the disease known as beri-beri in the Malay Archipelago is different from the beri-beri of Ceylon. In the former paralytic symptoms are marked, in the latter, while there is difficulty in locomotion, owing to the œdema of the lower extremities, there is no true paralysis. The derivation of the word, also, is different in the two cases. There are at least two principal forms of anæmia included under descriptions of the beri-beri of Ceylon:—

1. That form which is the result of malarial poisoning. Here there is the history of fever and of residence in a malarious district. The symptoms are debility, impoverishment of blood, enlargement of the spleen followed by dropsy and rarely by paralysis. The symptoms are all benefited by removing to a healthy place and by antimalarial remedies.

2. That which forms the subject of the report, and which depends on the presence in the duodenum and jejunum of the ankylostomum, and, perhaps, on the presence in the cæcum of the trichocephalus dispar. The anæmia, an oligo-cythæmia, is due to loss of blood.

The following are the conclusions and summary of this able report:—

“That the ‘wet’ or ‘dropsical’ form of beri-beri, or the beri-beri of Ceylon, depends on the presence of the anchylostoma duodenale in the intestinal canal, is, in fact, anchylostomiasis.

“That while weakness, feebleness, or even numbness are present in or follow the Ceylon disease, there are no true motor paralytic symptoms. The paralytic form is not known, nor, as far as I have been able to ascertain, is the Ceylon disease followed by paralysis. The cases end in cure or death, or old chronic cases in atrophy with feebleness. In the beri-beri of other countries paralytic symptoms are present from the beginning or follow the dropsy.

“That the Ceylon disease may run an acute or chronic course, and that death is often appallingly sudden. The severity of the symptoms depends on the number of the parasites present in the intestines, the state of health, and the food.

“That the residence in an infected centre is necessary before the symptoms become fully developed. During this period the person is acquiring the parasites and losing blood from their presence, becoming anæmic, and finally dropsical if neglected.

“That the areas in Ceylon where this form of anæmia, or beri-beri, is prevalent will be found to present the conditions enumerated above, and that the cause will in all cases be the presence of the larvæ of these parasites in the drinking-water.

“That the disease, if recognized early enough in the dyspeptic or anæmic stage, yields readily to treatment; but if the case be neglected and dropsy set in, with degenerative changes in the heart and other organs, the prognosis is most unfavorable.

“That removal from the infected area, with instructions not to return to it, is essential. The best remedy for the expulsion of the anchylostoma is thymol, and for the anæmia iron, followed by digitalis or strophanthus. That no treatment will do good until the parasites are expelled.”

The beri-beri of Ceylon seems to be an altogether different disease from kakke of Japan; but such reports as the above are very valuable in that they differentiate the different diseases which have been, and probably still are, classed under the general name beri-beri.

MYOSITIS.

Of great interest is the question of the relationship and interdependence of neuritis and myositis. Senator, ¹¹⁴_{Bull. p. 61} in a most important article on "Acute and Subacute Multiple Neuritis and Myositis," calls attention to the fact that in cases of amyotrophic paralysis the spinal cord and the peripheral nerves have been studied rather to the neglect of the muscles. He reports two cases, the first of which presented the typical clinical picture of a multiple myositis, and only later, when tenderness of the nerve-trunks, cutaneous anaesthesia, retardation of the conduction of pain, etc., appeared, was the diagnosis of multiple neuritis plain. The muscles of the first case were examined after death, while pieces of muscle of the second case were extirpated during life and examined. In both cases the muscles presented, instead of the usual fatty degeneration and atrophy, the lesions of an acute interstitial myositis with intense vascular engorgement, an abundant proliferation of the nuclei both of the muscle-fibres and of the vessel-wall, and great atrophy of the muscular fibres from compression. In the second case, but not in the first, granular cells ("mastzellen") were found both in the interstitial tissue and in the sarcolemma of the muscle, a condition never previously described. In the first case, in which the nerves could be examined, a neuritis parenchymatosa et interstitialis was found. He discusses at length the relation of the neuritis to the myositis in these cases without being able to decide which process is the primary one, and thinks that in some cases the myositis, in other cases the neuritis, is the primary affection, and that the same infectious virus or other toxic agent may attack sometimes the muscles, sometimes the peripheral nerves, and sometimes the spinal cord, especially the nerve-cells in the anterior horns. In the discussion ⁶⁹_{June 7} following the reading of Senator's paper, Rosenheim stated that in a case of neuritis he had seen granular cells ("mastzellen") in the muscles as described by Senator. As a result of his investigations he concluded that the occurrence of these granular cells depended on peculiar nutritive

conditions of the nerves. They did not occur in children, and were rare in adults before the age of fifty years; in old persons they were very numerous in the nerves, but did not occur in the brain or spinal cord. They were very abundant in the nerves of the extremities which had been a long time paralyzed. He found that in the muscles they lay directly on the sarcolemma in groups of two to four, and in the nerves they lay close to the sheath of Schwann. He claims that there is no absolute distinction between myositis and neuritis; that they are both due to the same cause, and that in one case the muscle, in another case the nerve, is first affected, while in other cases they are both affected together. He thinks it probable that the cause common to both processes is a micro-organism or the poison which a micro-organism generates in the body. Waetzold, in this same discussion, reported two cases of polymyositis occurring in the puerperal state, the one commencing on the third day and terminating fatally on the fifth day, and the other commencing in the seventh week after a mild parametritis and terminating in recovery. In the case terminating fatally an intense parenchymatous and interstitial myositis without fatty degeneration was found. The same changes, though less severe, were found in pieces of muscle extirpated from the second case which ran a favorable course. From cultures from the second case streptococci were obtained. In this same discussion Leyden pointed out that at first, muscular atrophy, in cases of the nature under discussion, was considered to be due to disease of the muscles themselves, and that later it was supposed to be due to disease of the gray matter of the spinal cord, but that subsequent investigations had shown that both these conceptions were too narrow and one-sided, and that muscular atrophy might result not only from them but also from a neuritis. It has been further shown that each of these three lesions might be present and yet there might be no muscular atrophy. In regard to the changes taking place in the muscles themselves these might be either inflammatory processes or simple atrophy and degeneration, or atrophy associated with the deposition of fat, as in the pseudo-hypertrophic paralysis of children, or, finally, the myositis described by Waetzold. Leyden did not think that Erb was justified in the hypothesis which he had put forth, that the muscular atrophy was due to a transient change in the gray matter of the spinal cord which had

disappeared before death. Remak, in this same discussion, states his belief that under myositis as well as under neuritis a number of totally different affections are classed, and points out that this may be due in part to the nature of the toxic agent causing the disease; as, for instance, alcohol acts especially on the sensitive nerves, lead on the motor, etc.

Jacoby²⁴²_{Nov.} reports a case of subacute progressive polymyositis which was characterized by pain, swelling, and paralysis, beginning in the muscles of the lower extremities, and successively involving nearly all the muscles of the body, with ultimately atrophy of certain groups, and which ended fatally, after two and a half years, through involvement of the respiratory muscles. There was found on microscopical examination an acute myositis and perimyositis grafted on a chronic plastic or formative process. Neumann,⁴⁵_{Jan. 31} under the name myositis syphilitica, describes a painful tenesmus of the sphincter ani muscle occurring in syphilis, which is not due to a fissure of the anus but to an inflammatory process in the muscle, similar to that which has been observed in other muscles as the result of syphilitic infection. This syphilitic myositis of the sphincter ani muscle is not infrequent, and occurs much oftener in women than in men. Anatomically, it is characterized by hyperæmia of the muscle, with multiplication of the nuclei of the sarcolemma, followed by increase of the connective tissue and atrophy of the muscular fibres, in consequence of which strictures and imperfect closure of the anus results.

Véron²⁴³_{June} reports a case of acute infectious myositis. Leudon⁶_{Apr. 21} reports a case of myositis ossificans. Wagner,²⁶_{Feb. 12} under the title of "A Case of Acute Polymyositis," reports the case of a tuberculous woman, aged 36 years, who was attacked by rigidity and pain in the muscles, accompanied by œdema. The electrical reaction of the muscles was not altered. The patient died of asphyxia. On examination there were found interfibrillary hæmorrhages and œdema of the muscular fibres obscuring striation. Some fibres showed all the stages of cloudy swelling and fatty degeneration. Elsewhere there was amyloid change. There was also interfibrillary cellular proliferation. The nerves also showed signs of peripheral neuritis.

Muscular Atrophy Associated with Articular Rheumatism.
—Much interest has been manifested as to the cause of the

atrophy which occurs in cases of articular rheumatism, and which is usually situated in close proximity to the inflamed joint, but sometimes in more remote regions. Strümpell³⁴_{Mar²⁹} discusses the cause of these atrophies at length. They occur too quickly and are too extreme to be due to disuse of the muscles. The hypothesis of Charcot,¹⁰⁶³_{1.3,p.36} which is adopted by many of the French observers, is to the effect that an irritation arising in the inflamed joint is propagated along the sensory nerve to the nerve-cells in the anterior horns of the gray matter, and according as it causes either an increase or a diminution of the molecular movement in the nerve-cells there results a contracture or an atrophy of the muscles connected with them. Against this hypothesis of Charcot Strümpell raises the objections that the assumption that a reflex inhibitory action on the spinal nerve-cells of such force as to cause an extreme degree of muscular atrophy is not only unproved, but in the highest degree improbable and contrary to analogy; that in the muscular atrophy associated with rheumatism the reaction of degeneration is not present, as it is in atrophies of spinal origin; and, further, that the simultaneous occurrence of muscular contracture and muscular atrophy is most difficult to explain by this hypothesis. He then mentions the researches of Pitres and Vaillard,⁹²_{June, '87} who examined the peripheral nerves in three cases of chronic rheumatism, and found them diseased in all, there being a close correspondence between the degree of muscular atrophy and the degree of degeneration of the nerves. He, however, thinks that the neuritis is only one component part of the entire peri-articular inflammation, which involves nerves, muscles, tendons, and ligaments, either by a direct extension of inflammation from the inflamed joints, or in consequence of some chemical poison which is in the neighborhood of the inflamed joint; and he asks, Why should the inflammation extend only to the neighboring nerves? In answer to this question it might be urged that neuritis is very commonly met with in infectious diseases, such as articular rheumatism probably is. Strümpell then reports a valuable case of acute articular rheumatism involving many joints, but affecting especially the left shoulder-joint, which was followed by paralysis, pain, tenderness, and atrophy of the deltoid and triceps muscles in an extreme degree, and of the biceps, trapezius, pectoralis major, infra- and supra-spinatus, and the rhomboidei, in

a mild degree, on the left side. There was no disturbance of sensibility, and recovery took place in a couple of months. He considers that in this case the paralysis and atrophy were myopathic and not secondary to any disease of the peripheral nerves or spinal cord.

On the other hand, Bury⁹⁰_{June} has published a very valuable and profusely illustrated paper, entitled "Peripheral Neuritis in Acute Rheumatism," in which he reports eleven interesting cases in which muscular atrophy, apparently due to neuritis, followed an acute attack of rheumatism. He also mentions six similar cases occurring in the practice of Dr. Barlow. Bury states that one of the plainest and commonest phenomena of acute, subacute, or chronic rheumatism is wasting of the interosseous muscles of the hand, and that while some cases may be explained in the same way as other arthritic atrophies, viz.: reflexly from inflamed knuckles, there is sufficient evidence that in a large number of cases the atrophy is due to an ulnar neuritis. Confirmatory evidence of neuritis is afforded by the frequency with which impaired cutaneous sensibility is met with in the ulnar nerve territory, along with thickening and tenderness over the trunk of the nerve itself. Although the ulnar is by far the commonest nerve to be affected, there is substantial proof that other nerves of the brachial plexus and branches of the lumbar and sacral plexuses are also frequently attacked. It is of great significance that these peripheral nerve symptoms may occur in a limb quite free from joint irritation. The value of Bury's article is greatly enhanced by a full consideration of the literature of the subject. It seems almost certain from his paper that in many cases of acute rheumatism the muscular atrophy is due to a neuritis.

MUSCULAR DYSTROPHIES.

For the sake of those of our readers who have not the history of the subject fresh in their memory, it seems desirable to commence the study of the muscular dystrophies by a presentation of the general questions in dispute, and this can be best done by summarizing rather freely the valuable paper of Sachs,¹_{Dec. 8, 15} who, in an historical introduction, goes over what is to many readers well-known ground. Duchenne, in 1849, first described the disease progressive muscular atrophy, and later¹⁰³¹ described it fully and

distinguished two forms—the progressive muscular atrophy of the adult, and progressive muscular atrophy of infancy—and in the same book he described fully pseudo-hypertrophic muscular paralysis, which had been imperfectly described before. Until very recent times these were the only forms of progressive muscular dystrophies recognized. In regard to the lesion of progressive muscular atrophy there has been much diversity of opinion. Duchenne at first regarded it as of peripheral origin, but later, yielding to the array of pathological anatomical facts collected by many observers, especially by those of France, of whom Charcot was the chief, he regarded it as of spinal origin. For several years, then, it appeared settled that the primary lesion was an atrophy of nerve-cells in the anterior horns of gray matter of the spinal cord and inflammatory changes in the neuroglia, and that the inflammation spread slowly from these nerve-cells along the motor nerves and caused an atrophy of the muscles. In 1873, however, Friedreich disputed this view and affirmed that progressive muscular atrophy is a primary chronic myositis, which is followed in due course of time by secondary changes in the nervous system. From that time to the present many investigations have been carried on to solve the question as to whether progressive muscular atrophy is of spinal or muscular origin, and during the past year or two the solution seems to have been achieved, and the truth found to lie midway between the two extreme points, for it seems that the classic form of progressive muscular atrophy of the adult, which Duchenne describes as commencing in the hand, is always of spinal origin, while the form of progressive muscular atrophy of infancy of Duchenne and the pseudo-hypertrophic muscular paralysis are always of muscular origin.

But these three are not the only forms of muscular atrophy which are now recognized; on the contrary, the disease is divided into several types. One of these is the juvenile type of Erb, which is characterized by a progressive wasting with weakness of certain groups of muscles, beginning either in childhood or early youth, involving, as a rule, the muscles of the shoulder girdle, the upper arm, the pelvic girdle, the thigh, and the back, the forearm and leg muscles remaining intact for a very long time. The atrophy may be associated with true or pseudo-hypertrophy of some muscles. Fibrillary contractions and reaction of degeneration are

never present. Another type is the hereditary form of Leyden, which attacks several members of the same family, occurs at an early age, and begins with weakness and wasting of the muscles of the back and lower extremities. Males are more apt to be attacked than females. Another type is the facio-scapulo-humeral type of Landouzy-Déjerine, which is Duchenne's progressive muscular atrophy of infancy. This form begins in early life in the muscles of the face and later extends to the shoulder and arm muscles. Another type is the peroneal form, which begins in early youth in the extensors of the toes and then involves the peronei and the small muscles of the foot and then the muscles of the calf; after some little time the muscles of the thigh become affected and several years later the disease shows itself in the hands. The peroneal type may, perhaps, be of spinal origin, but all the other types are of muscular origin. Sachs gives a brief description of each variety and reports three cases of his own, two being examples of pseudo-hypertrophic muscular paralysis and one an example of the peroneal type of progressive muscular atrophy. He then raises the question whether from an examination of a piece of the muscle alone we can decide whether the disease is of spinal or of muscular origin. He considers that post-mortem examinations are alone entirely satisfactory, but that in the examination of a muscle the presence of any considerable number of hypertrophied fibres, side by side with atrophied and degenerated fibres, is sufficient proof to exclude such a case from the spinal form.

Gray¹_{May 19} gives an interesting summary of our present knowledge regarding muscular atrophies and hypertrophies. He briefly considers the anatomy of the neuro-muscular apparatus, and then considers the following diseases of the neuro-muscular apparatus which lead to muscular atrophy or hypertrophy, associated with muscular paralysis and the electrical reaction of degeneration: (1) myelitis of the anterior horns; (2) glossio-labio-laryngeal (bulbar) paralysis; (3) progressive ophthalmoplegia; (4) muscular pseudo-hypertrophy; (5) progressive muscular atrophy. In regard to the pathological anatomy of these diseases Gray states the well-known fact that the first three forms of disease are due to destruction of the motor nerve-cells in the anterior horns of the gray matter of the spinal cord or in the motor nuclei lying in the floor of the fourth ventricle, or aqueductus sylvii. The fourth form of

disease he considers as of purely muscular origin, and the fifth form sometimes of central, sometimes of muscular origin, and rarely a combination of the two. He gives the prominent symptoms of each of these diseases and considers progressive muscular atrophy at some length, speaking of each of the four types in which it occurs and arranging the sequence in which the muscles atrophy in the different types in a tabular form. Some valuable remarks on the diagnosis and treatment of these affections, as well as a bibliography, close this valuable article, which would have been made more complete by introducing neuritis among the diseases causing muscular atrophy, although truly in neuritis the sensory as well as the motor apparatus is involved. Raymond¹⁰⁰_{Oct. 6} traces the history and gradual development of our knowledge concerning the muscular dystrophies, and Pick¹⁰⁰⁰_{Ed. 13, 16} gives most excellent summaries of our knowledge, both of progressive muscular atrophy and of pseudo-hypertrophic muscular paralysis.

Turning now to some of the more original work, we must mention at the outset the two valuable papers of Erb and Hitzig. In a paper read at the thirteenth meeting of German neurologists, at Freiburg, June 9th and 10th, Erb⁷⁵_{July 1} states that in 1883 he suggested that it was possible to divide clinically the forms of progressive muscular atrophy into two classes: a spinal form (*amyotrophia spinalis progressiva*) and a probably myopathic form (*dystrophia muscularis progressiva*). Under the latter class Erb includes the juvenile type of muscular atrophy (Erb), the pseudo-hypertrophic paralysis of children, the hereditary form of muscular atrophy (Leyden), and the infantile progressive muscular atrophy (Duchenne), with involvement of the face. This latter form is often called the type of Landouzy-Déjerine, it having been described in detail by these observers. The hereditary form of Leyden Erb does not admit as a separate form, because all the forms are frequently hereditary. Erb then discusses the question whether the four forms really constitute a clinical entity and whether the same lesion is common to all the forms, and comes to the conclusion that since these forms correspond to each other so closely in all essential points, therefore they can fairly be regarded as forming a clinical entity, and also that they depend upon a common pathological process, which he regards as being somewhat as follows: First, hypertrophy of the muscular fibres, followed by a change from a polygonal to a

circular transverse section, subdivision, slight increase in nuclei in the connective tissue, then a gradually increasing atrophy of the fibres, and decided connective-tissue hypertrophy, and with the further progress of this process a deposition of fat. The existence, therefore, of a dystrophia muscularis progressiva embracing the four forms mentioned above seems to be well established.

Hitzig, ⁴ June 18; Aug. 21, 27 in a communication of great value, reports four cases of progressive muscular atrophy of the juvenile type (Erb), in all of which portions of the muscles excised during life were subjected to careful microscopical examination. Clinically these cases were of much interest. Two of them showed fibrillary contraction, which is unusual in the muscular form of the disease. In Case 2 there was a firm contracture of the biceps muscle in an early stage of the disease. In Case 3 there was a "wing-like" projection of the inner edge of the scapula, although the serratus magnus muscle was not paralyzed; so that he agrees with Marie and Guinon ⁹² _{p. 211, 85} in regarding this deformity in the position of the scapula as not absolutely characteristic of paralysis of the serratus magnus, but as being due also to paralysis of the rhomboidei muscles. In Case 4 the biceps muscle was very inexcitable either by the will or by electricity, and yet it contained an abundance of striated muscular substance, which was only slightly altered in character. Case 4 also presented paraesthesiae, exaggerated reflexes, and so many symptoms of spinal disease as to force him to the conclusion that there are certain cases of progressive muscular atrophy in which the differential diagnosis between a muscular and a spinal lesion is only possible after an examination of the excised muscle, and perhaps not even then in all cases. But the greatest value of his paper lies in the anatomical rather than in the clinical part. In the main, the results of his examination confirm and amplify the conclusions of Erb. In one case the disease had existed only four or five months, and in another the muscle examined had only recently been attacked; and they are the only cases published in which the muscles have been examined at this early date. The muscular fibres were all greatly hypertrophied, their transverse section circular rather than polygonal, their transverse striation either absent or very indistinct, the nuclei of the sarcolemma greatly increased, and many fibres presented indentures which were apparently the commencement of subdivision. The

examination of these two cases in the early stage of the disease, then, confirms the generally accepted belief that a hypertrophy of the muscular fibres precedes their atrophy. In the other two cases, which were in a later stage of the disease, along with the hypertrophied muscular fibres were many atrophic fibres, their transverse section being either circular or elliptical, sometimes extremely elliptical. In all of the four cases the portions examined showed an absence of normal muscular fibres, the fibres being either hypertrophied or atrophied or exhibiting signs of commencing atrophy. He explains the process as follows: The normal polygonal contour of the muscular fibres is the product of the energy of growth of the fibre and of the external resistance to that growth. In the early stage of the disease when the energy of growth is extreme it entirely overcomes the external resistance and the contour of the fibre becomes circular. It seems, however, as though the irritation impelling the fibres to hypertrophic growth was not diffused equally over all the fibres and bundles of fibres of the muscles, and that those fibres which had less of this irritation were pressed upon by their rapidly growing neighbors, and not only were atrophied, but their contour was distorted and altered in accordance with the varying pressure from different sides. It is, therefore, probable that the final cause of the atrophy of the muscular fibres in a number of cases of the juvenile type of muscular atrophy lies in a purely mechanical factor, viz.: the limitation of space. Inasmuch as Hitzig found no increase of the intermuscular connective tissue in his cases, he concludes that the primary and essential condition in the juvenile type of progressive muscular atrophy consists not in an interstitial, but in a parenchymatous process, which first manifests itself in an hypertrophy of the muscular fibres, more or less extreme according to the intensity of the disease; while the pseudo-hypertrophic form of muscular atrophy differs from the juvenile type in that in the former there is an active participation of the interstitial tissue in the pathological process.

Limbeck,⁴⁰⁵_{B419} under the title "Dystrophia Muscularis Progressiva" (Erb), reports the cases of two sisters in whom weakness and atrophy appeared in the flexors of the hip and extensors of the back. Early in the disease, in one of these cases, a portion of the erector trunci muscles was excised. It showed no increase of the

perimysium externum or internum or of the muscle nuclei. At some points there was slight increase of the connective tissue with a formation of fat, apparently at the expense of the contractile substance. The progressive changes in the muscular fibres were as follow: There developed suddenly at some point of the fibres a rounded swelling with a disappearance of the striation, which took only a diffuse stain from carmine (coagulation). This change gradually extended to the whole fibre, and the sarcolemma could then be seen distinctly outlined and with nuclei, but filled only with a homogeneous, shining substance, which could be stained only diffusely and which exhibited only here and there evidence of transverse striation.

Strümpell ³²⁶_{Bd. 42: H. 1, 3} calls attention to the fact that of late attention has been devoted almost exclusively to the primary myopathic forms of muscular atrophy, to the neglect of the spinal forms. He then describes three cases of muscular atrophy in which the post-mortem examination revealed, in addition to a high degree of degenerative muscular atrophy, an atrophy of the motor nerve-fibres, almost complete atrophy of the nerve-cells in the anterior horns of the cervical, and, to a less degree, in the lumbar enlargement, and a degeneration throughout the whole extent of the pyramidal tract, which was of moderate degree unilateral, and had its origin in a focus of cerebral thrombotic softening in the first case, which was of moderate degree, and bilateral in the second case, and was of high degree and bilateral in the third case. In consequence of this bilateral degeneration of the pyramidal tract in the second and third cases, the patients presented during life spastic symptoms, slight in the second, extreme in the third, and entirely absent in the first case. Strümpell leaves unsolved the question whether the degenerative process commences in the peripheral nerves or in the ganglion cells of the anterior horns. Charcot's statement, that in amyotrophic lateral sclerosis the muscular atrophy attacks the muscles more diffusely than in the common spinal progressive muscular atrophy, is not confirmed by his experience, and he also finds that Charcot's statement, that in amyotrophic lateral sclerosis the paralysis precedes the atrophy, is true only for the legs; in the arms it is impossible to differentiate the atrophy from the paralysis.

Heubner ¹⁶²⁵_{p. 29} describes the case of a child who at the age of

three years, after scarlet fever, exhibited a difficulty in walking, due to weakness of the legs and back, associated with muscular atrophy. After the age of fifteen years the child was unable to walk, and presented a general muscular atrophy, especially in the legs and back. There was no reaction of degeneration, no disturbance of sensibility, and an absence of the tendon reflexes. At the age of twenty-one years the patient died of pulmonary tuberculosis. The examination of the organs after death showed that almost all the muscles were diseased, and that those most affected consisted almost entirely of fat and connective tissue. The changes found were those characteristic of primary muscular atrophy, thinning, subdivision, hyaline degeneration, a few hypertrophic fibres, vacuoles, absence of fatty degeneration. In the spinal cord the nerve-cells in the anterior horns had in great part disappeared. The atrophy of the nerve-cells was most marked in the middle and upper part of the lumbar enlargement. The anterior nerve-roots were atrophied and contained but few nerve-fibres. The peripheral nerves were normal. He considers that the atrophy of the nerve-cells in the anterior horns cannot be regarded as secondary, although clinically the case presented the features of a primary progressive muscular atrophy. Preiss¹¹³_{Apr 1} reports the case of a maiden aged twenty-three, who presented during life the symptoms of pseudo-hypertrophic paralysis of eight years' duration. An examination of the muscles obtained at the autopsy showed extensive changes. In addition to simple atrophy or thinness of the fibres (many of these fibres contained brown pigment, while others presented varicosities), there were other fibres which exhibited granular degeneration and others which presented a waxy degeneration, very similar to Zenker's degeneration, except that they contained large multinuclear cells. Even in the most degenerated muscles were many hypertrophic fibres, some measuring one hundred and seventeen thousandths of a millimetre in thickness. The interstitial connective tissue of the muscles was hypertrophied and infiltrated with cells, and in many places consisted of fatty tissue, which was very vascular. The lesion in this case, however, was not confined to these muscular changes. The intramuscular nerve-filaments also exhibited extensive alterations, thinning of the nerve-fibre, swelling or disappearance of the axis cylinder, thickening of the perineurium and surrounding connective

tissue, to such an extent that the nerve was converted into a band of connective tissue in which it was difficult to find any nerve-fibres. The large nerve-trunks and anterior nerve-roots exhibited a number of atrophied nerve-fibres and spaces from which the nerve-fibres had entirely disappeared. The spinal cord also exhibited decided lesions, consisting of hæmorrhages in the gray matter in the middle dorsal and upper lumbar region, and the nerve-cells in the anterior horns were in part atrophied. In consequence of these extensive lesions in the nervous system, this case must be regarded either as belonging to Schultze's fourth group (muscular atrophy with slight changes in the nerves and spinal cord) or as a case of pseudo-hypertrophic paralysis of spinal origin.

Babinski and Onanoff⁵⁵_{Feb. 25} have undertaken an investigation as to why it is that in primitive progressive muscular atrophy certain muscles are more frequently the seat of atrophy than others. They have sought for this explanation in the different degrees of development of the muscles and have examined microscopically the muscles of a five-months-old fetus, finding that at this period of development different muscles have attained very different degrees of development, and that those most developed at this period are the ones most commonly attacked in cases of primitive progressive muscular atrophy. They conclude that the results of their researches are conducive to the establishment of a law of co-relation between the degree of predisposition of the muscles to atrophy and the degree of rapidity of their development, and show that there exists in certain cases, for the muscular as well as for the nervous system, a connection between pathological anatomy and embryology. These interesting researches, of course, need confirmation before they can be generally accepted.

Oppenheim³⁹⁹_{Vol. 13, p. 374} reports a case of progressive muscular atrophy of the juvenile type in which, in addition to the usual symptoms, there was an involvement of the external and internal recti muscles of the eye and of the levator palati muscles and of the adductors of the vocal cords. Spillman and Haushalter⁹²_{No. 8} report a case of progressive muscular atrophy of the infantile facial type. The case is interesting and is reported in great detail, and illustrated by numerous photographs. Herringham⁴⁷_{July} reports two cases of progressive muscular atrophy of the peroneal type, occurring in

cousins, in which the family history can be traced back through five generations. Twenty male members of the family were probably affected with this disease, and a number are still very young, so that the disease may perhaps develop in some of them later. Not one of the female members of the family was affected, and yet the disease was transmitted only through these healthy females to their male children, while the diseased males never transmitted the disease to their children, but only to their grandchildren, through their daughters. Levin³⁷⁰_{v.49, 37} reports three cases of progressive muscular atrophy of the peroneal type, affecting a brother and two sisters, which, on that account, he regards as hereditary. Lichtheim²¹⁴_{Oct.1} reports three cases of hereditary progressive muscular atrophy which were probably of the peroneal type. Clarke¹³¹_{Sept.} reports an interesting case of an apparently commencing progressive muscular atrophy with recovery under anti-syphilitic treatment. Leclerc and Françon¹⁹²_{Aug. 10} and McPhedran³⁹_{Nov.} report cases of progressive muscular atrophy.

Inglis²⁴²_{Aug.} reports a number of cases of pseudo-hypertrophic paralysis occurring in brothers and cousins. In these cases (as is usual) the disease was transmitted through healthy females to their male children, and the author appends a discussion on the pathology of the various forms of muscular atrophy which is of interest; but he is probably in error when he regards pseudo-hypertrophic muscular paralysis as of spinal origin. Böhi²¹⁴_{Feb. 15} reports two cases of pseudo-hypertrophic muscular paralysis and one case of progressive muscular atrophy of the juvenile type (Erb). Riggs¹⁰⁵_{Aug. 15} Bower²³¹_{May} and Middleton²¹³_{June} each report cases of pseudo-hypertrophic muscular paralysis.

Under the title, "A Case of Non-progressive Muscular Atrophy," Butakow⁵⁹⁰_{v.2} reports the case of a peasant, aged fifty-four years, who noticed for the first time during his convalescence from a severe attack of fever, when he was fifteen years old, that he could not hold his head up, and since that time the muscular atrophy has steadily increased. The muscles of the neck were so weak that the head fell in every direction, following the law of gravity. The atrophy involved the muscles of the face, neck, and all the muscles concerned in movement of the shoulder-joint. None of the other muscles of the body were affected and the movements of the extremities were not impaired. Booth⁵⁹_{Sept. 1} reports

an interesting case of progressive muscular atrophy with anæsthesia. The atrophy and paresis affected not only the muscles of the arm and shoulder, but also those of the larynx, soft palate, and face, while the anæsthesia and analgesia were limited to the left arm and the left side of the head, neck, and thorax. The knee-jerks were exaggerated. He is inclined to think that the motor symptoms were due to a "degeneration of the ganglion cells of the anterior cornua," and the sensory symptoms "to a tumor in the upper and outer layers of the pons varolii, or peduncle, on the right side." As M. Allen Starr justly remarked in the discussion following the reading of this paper, the symptoms in this case indicate a syringomyelitis rather than a progressive muscular atrophy.

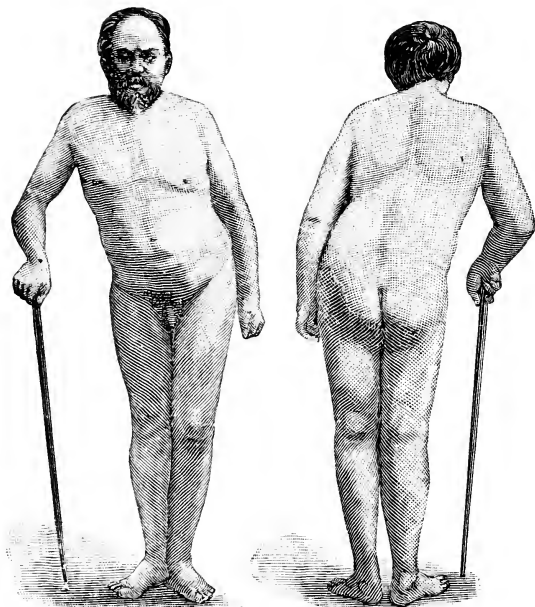
NEURALGIA.

One of the most important papers on the subject of neuralgia is that of Witzel, although it is a matter for doubt whether the condition which he describes is not a neuritis rather than a neuralgia. Under the title, "Ganglia on the Palmar Surface of the Hand as a Cause of Neuralgia," he ³⁹⁶_{Feb. 25} describes five cases of brachial neuralgia [neuritis?] which were due to cystic growths in the palm of the hand. These cysts contained colloid matter, were attached to the flexor tendons, and apparently primarily had their origin in herniæ of the joints. According to Witzel, only very few cases (and those mostly by French observers) of palmar ganglia have been described, and yet from his cases it appears that they constitute a well-characterized affection, the recognition of which is important to the practitioner as explaining certain cases of obscure brachial neuralgia. He summarizes the disease as follows: The affection usually develops, without apparent cause, during the first half of life. A small, tender area of hardness forms in the vola manus at the base of one of the fingers. Next, the indurated spot gives rise to discomfort in grasping, later becomes very tender to pressure, and finally is the seat of neuralgic pains, which radiate in the course of the median and ulnar nerve, even as far up as the shoulder. After the affection has existed several weeks a decided sensitiveness of the corresponding nerve-trunks may be demonstrated. Tactile examination of the palmar surface of the hand elicits great tenderness to pressure at the level of the metacarpo-phalangeal joint. More careful palpation dis-

closes the presence of a nodule somewhat laterally to a prolongation of the median line of the fingers; in adults, about two centimetres distant from the free margin of the interdigital fold. Concerning the size, form, and consistency of this structure, it is difficult to gain an accurate conception even in the delicate hand of a woman. Usually the small tumor appears of cartilaginous or osseous hardness, in consequence of its tense and thick cutaneous envelope, and is not well defined from its surroundings. The presence of lateral movement excludes the possibility of any connection with the bone, and its relation to the sheaths of the tendons is manifested by the fact that it accompanies the movements of the tendons in flexion and extension of the fingers. There can be no doubt as to the relations existing between this form of tumor and the neuralgia. The cyst forms under unyielding integument, and, lying at the side of the tendon sheath, exerts during its further growth a lateral pressure against the neighboring nerve-trunks. Later, the local condition is similar to that in cicatricial compression of the nerves—a condition shown by the author to be due to an ascending neuritis. Plenio³³⁶_{Apr. 14} reports a case of brachial neuralgia caused by a ganglion on the palmar surface of the hand, which is quite similar to those reported by Witzel. In the former's case the cyst, containing colloid matter, had, apparently, no connection with the joint, but only with the tendon, and was, therefore, of the tenogenic variety. Up to the present time, of all the reported cases eight belong to the arthrogenic and three to the tenogenic variety.

Nourric¹⁰³⁶ reports two cases of severe neuralgic pains in both arms which disappeared after a few days' duration. From these cases Nourric concludes that there can exist a simple congestion of the cervical spinal membranes, which does not necessarily develop into an inflammatory condition, but which, by irritation of the spinal roots, causes double brachial neuralgia. The assumption of this congestion, etc., seems to be entirely hypothetical. Quénu³_{Feb. 12} has found greatly dilated veins in the interior of the sciatic nerves of persons with varicose veins. Among sixty-seven persons suffering from varicose veins he has met with eleven suffering from sciatica. This he thinks due to the dilated veins in the nerve, and he has obtained excellent results in such cases by the application of elastic stockings. Babinski,⁹⁴_{Jan.} in an elaborate and beautifully

illustrated paper based on five cases, three of which he reports at length, describes a faulty attitude of the body which certain cases of sciatica present, and which is characterized by an inclination of the body toward the healthy side, the foot of the painful leg not being lifted from the ground. This attitude is well shown in the accompanying figure. Bouchard²²⁰_{Mar. 23, '91} reports two cases of sciatica which presented the same faulty attitude, but the body in both



FAULTY ATTITUDE OF THE BODY IN SCIATICA. (*Archives de Neurologie.*)

instances was inclined toward the side in which the sciatica existed, and, in so far, were exactly the reverse of the cases described by Babinski. Erb⁷⁵_{p. 69} calls attention to the fact that this faulty attitude in cases of sciatica had been previously described¹¹³_{No. 26, '86; No. 39, '87} by Nicoladoni.

Falkenberg,⁶⁹_{Apr. 19} under the title of "Neuralgia of the Phrenic Nerve resulting from Injury," describes the case of a girl who, in consequence of a sharp blow on the epigastrium, complained of pain

in the epigastrium and in the left infra- and supra-clavicular fossæ. Her pulse was one hundred and twenty, respiration thirty-five and superficial, pressure on the epigastrium caused an exacerbation of the pain, which radiated upward along the left border of the sternum to the neck, and pressure between the two origins of the sterno-cleido-mastoid muscles over the trunk of the phrenic was also painful. Under a treatment consisting of potassium bromide internally and mustard pastes and a liniment of veratrum and chloroform externally the patient improved greatly in twelve hours and made a rapid recovery. He thinks that this is a case of neuralgia of the phrenic nerve, similar to the cases described by Peter,³⁶⁾_{Bd.17,71} and in support of his position quotes from Luschnka to show that the phrenic nerve, like all the other spinal nerves, contains sensory as well as motor nerve-fibres. Van Allen²¹⁶_{Feb.'88} reports two interesting cases of supraorbital neuralgia associated with disease of the eye and probably due to the accommodative action of an irritable ciliary zone. Temporary relief was afforded by the use of atropine and permanent relief by enucleation of the eye, already rendered useless by disease; and Shakespeare and de Schweinitz⁵_{Mar.} report a very interesting case of ciliary neuralgia of the left eye, which returned and persisted in the right eye after the left had been extirpated. The ciliary neuralgia had been preceded by severe attacks of neuralgia in other parts of the body. Busey⁶¹_{Nov.17} reports an interesting case of neuralgia of the lingual nerve, and Hughes¹⁰²_{Sept.} a case of cervico-brachial neuralgia excited by arm and shoulder strain.

Treatment.—In regard to treatment Gray¹⁴³_{Sept.} gives a very good summary of the modern treatment of neuralgia, and Pietrzkowski⁸⁸_{No.42-51,'87} reports the cases on which Gussenbauer⁸⁸_{No.31,'86} based his treatment of trigeminal neuralgia. The cases were twenty-seven in number, many of them chronic and obstinate, and in twenty-two there was obstinate constipation. This was regarded as the cause of the neuralgia, and against it the treatment, which consists in cold-water enemata, moist, warm packs about the abdomen, massage of abdomen, and rubbing of the abdomen with cold water, was principally directed. This treatment was carried out continuously during from two to six weeks, and the diet of the patient was carefully regulated. In many cases, in addition to this, other forms of treatment, such as galvanization of the cervical sympathetic and

massage, were used. Five cases were operated upon (nerve stretching or resection) and four of these were cured. Of the remaining twenty-two cases eleven were cured and nine were improved. He also reports fourteen cases of neuralgia in other parts of the body treated on the same general plan, seven of which were cured, four improved, and in three of which there was little or no improvement. These last were cases of sciatica in which the stretching of the nerve caused only a slight and temporary improvement. Stewart⁸⁰_{June 15 Jan.} speaks in high praise of electricity, heat (electro-vapor or electro-thermic baths), massage, manual and mechanical, Swedish movements, health gymnastics, and other forms of exercise. Corning¹⁰¹_{Jan.} recommends a rather formidable proceeding for the relief of certain obstinate forms of neuralgia, which he calls the endermic use of cocaine, and which consists in removing the epidermis by vesicating collodion and covering the denuded surface with an India-rubber membrane, the edges of which are securely glued to the surrounding skin. The rubber membrane is provided with a metal shield through which fifty minims of a 2 per cent. solution of cocaine may be introduced beneath the membrane. He mentions two cases which were benefited by this treatment. Frankl-Hochwart⁶⁵⁰_{Jan.} reports excellent results from the use of the electric brush in some obstinate cases of trigeminal neuralgia. LeFort¹⁵²_{Jan. 21} describes a case of supra- and infra- orbital neuralgia, in which the attacks were very severe and very frequent, which were excited by the slightest external irritation, as a breath of wind, and which did not depend on any ocular trouble or other assignable cause. In this case, in which the application of the faradic current caused some improvement but not cure, LeFort stretched the frontal and supra-orbital nerves with the result that the supraorbital neuralgia ceased, while the infraorbital neuralgia continued. At a subsequent operation he stretched the infraorbital nerve, causing the cessation of the infraorbital neuralgia. It is to be noted that the cure of the neuralgia did not ensue immediately on the operation, but it was some ten days after before the pains ceased entirely. Six months later LeFort saw the patient again, learned that she had had no further neuralgic attacks, and found that the sensibility was intact in the domain of the distribution of the nerves which had been stretched.

The external application of sulphur has been warmly recommended in cases of sciatica. Duchesne²¹_{Jan. 15} states that several years

ago Dr. De Mussy introduced in France a treatment for sciatica which had previously been used in England. This treatment consists in enveloping the leg in flowers of sulphur during the night. He has seen a permanent cure of a case of sciatica by a single application. Cowden⁶¹_{July 7} reports a case of severe sciatica in which the application of flowers of sulphur two nights in succession produced a speedy cure. McNutt⁹_{July 7} reports that he has used sulphur externally in seventeen cases of chronic non-inflammatory sciatica and in only six did it fail to give relief. In addition to the external application he also uses it internally in the following form:—

R Sulph. præcip.,
 Ferri carb.,
 Glycerinæ, āā 5 4 (15.6 grammes).
 Aq. gaultheriæ, ad 5 4 (124 grammes).
 Sig.: One drachm (3.9 grammes) every two hours.

There is also evidence that hypnotism is of value in certain cases of neuralgia, but certainly great caution is needed in its employment as a therapeutic agent. Weissenberg¹¹³_{May 20} describes the case of a maiden, twenty-two years old, who, during more than two years, suffered from severe attacks of headache, recurring several times each day and followed by painful cramps of one or, more commonly, of both eyelids. Pressure on the infra- and supra-orbital foramina was painful. She was neither hysterical nor anæmic, and no cause for the attack could be discovered. Almost every known remedy was tried without avail. The patient was hypnotized, and after a hypnotic sleep of a half-hour's duration she awoke entirely free from pain and continued so for two days. After having been hypnotized twice more, and after a six months' course of sea-bathing, she was greatly improved. Yakovenko⁵³⁰_{Nov. 2} has cured completely, after a number of *séances* of hypnotic suggestion, a severe and obstinate trigeminal neuralgia of a year's duration in a hysterical girl aged thirty-six years.

The value of antipyrin as an internal remedy in neuralgia was mentioned in the last issue of the ANNUAL. McKinn¹_{July 7} mentions a case of obstinate crural and sciatic neuralgia in which hypodermic injections of this drug gave great relief. He injected from fifteen to twenty-five grains (1 to 1.6 grammes) at a time, but only five grains (0.32 gramme) in any one place. The skin in the neighborhood of the injection was rendered anæsthetic during fifteen to twenty-four hours. The antipyrin should be dissolved in

rather more than its own weight of water for these injections. No abscess and but very slight induration had at any time occurred. Bryant⁷²_{June} reports a case of sciatica in which benefit, but not a rapid cure, was obtained from daily hypodermic injections of five grains (0.32 gramme) of antipyrin. These injections were more efficient the deeper they were and the nearer they were to the nerve-trunks.

Dana,⁸⁰_{July 16} as the result of his experience, concludes that menthol internally, in doses of from five to twenty grains (0.32 to 1.30 grammes), is a heart stimulant and nerve anodyne in migraine, trigeminal neuralgia, and in some cases of sciatica, and considers that it is an efficient and cheap substitute in many cases for antipyrin. It is best given in the form of a 25 per cent. alcoholic solution, diluted, when taken, with hot water. He has also experimented with saffrol (the camphor of the oil of sassafras), and finds that in doses of twenty drops or more it is of value in neuralgia, sciatica, and headache. Greene²²_{Sept. 12} recommends ammonium chloride in twenty-grain (1.30 grammes) doses for the relief of neuralgia, and Henry¹²¹_{Oct.} also reports an obstinate case of trigeminal neuralgia in which it was of value. Chéron¹⁴⁸_{July 25} recommends salol in doses of four to eight grains (0.26 to 0.52 gramme), daily, in cases of lumbo-abdominal neuralgia, especially in gouty subjects. Metcalf⁹⁹₉₇ recommends highly, as an internal remedy for neuralgia, a mixture consisting of equal parts of the tinctures of aconite-root, colchicum-seed, belladonna, *actea racemosa*, six drops to be taken every six hours till relief is felt. Edler⁸⁸_{July 11} warmly indorses the value of the mineral waters of Toeplitz in the treatment of neuralgia and reports several cases of cure from their use. Hoffmann⁷⁵_{Nov. 1} mentions two cases of obstinate neuralgia in which the employment of Adamkiewicz's diffusion-electrode, described in the ANNUAL, issue of 1888, vol. i. p. 149, proved of no value. He criticises the electrode at length and shows that it is constructed on false principles, and that the fluid (chloroform) which Adamkiewicz recommends is worthless on account of its action toward the galvanic current.

CEPHALALGIA AND MIGRAINE.

Cephalalgia.—A number of interesting papers have been published on the subject of headache in children. Day⁴⁶² discusses the principal factors in the production of the headaches of children, among the chief of which are hereditary and faulty educa-

tion, overpressure and bad ventilation in school, and errors of refraction in the eyes. The treatment is in the main etiological, together with tonics and a proper amount of sleep. Joal¹³⁶_{July} reports two cases of persistent frontal headaches, associated with a sluggishness of mind, nervous irritability, and nightmares. In both these cases there was hyperæmia and hyperæsthesia of the nasal mucous membrane, and after this had been treated with the actual cautery the headaches ceased. Such headaches as these have been considered as incident to the growth and development of the body; but Joal rightly insists that many are due to errors of refraction in the eyes or to nasal disease, as in the two cases which he reports. In the first case the headaches were most severe at the time of an attack of herpes preputialis, and in the second at the menstrual epochs; from which he reasons that the headaches of adolescence may be caused by pathological irritation of the genitals in masturbation or by the physiological irritation of the genitals which takes place at the time of puberty. Béranger²²⁵_{Aug.} describes a condition in children characterized by congestion of the skin and mucous membranes of the head, associated with elevation of temperature and pulse, with anorexia and a restless drowsiness, and considers it to be analogous to migraine in the adult, but that in children, in consequence of the meningeal congestion present in this disease, it is necessary to treat it actively, the most valuable remedy being antipyrin given hourly in doses of two and a half grains (0.16 gramme) to a child six months old, and in doses of four grains (0.26 gramme) to a child a year old, until relief is obtained. Vergely¹⁷_{Sept.4} states as the results of his observations that pharyngitis of any form is accompanied by pain in the occiput, but that when the Eustachian tube, the middle ear, or the tympanum is the seat of inflammation the pain is referred to the external ear or its neighborhood. If the catarrh reaches the nasal fossæ or the sinuses connected with them the pain is felt at the root of the nose or in the supra- or sub- orbital region. Curtis¹_{Jan.14} reports the case of a woman in whom a severe syphilitic headache (which rapidly yielded to syphilitic treatment after the other forms of treatment had failed) made its appearance very early (six weeks) after the primary affection. A week after the headache had been cured a characteristic syphilitic sore throat developed. Osgood⁵⁹_{July.26} read an interesting paper on inveterate headache, and

in the course of the discussion following Whittier exhibited a chart in which the various forms of headache were tabulated in an instructive manner.

Tuckermann⁵⁹_{Aug. 18} and Moyer¹³⁹_{Mar.} recommend antipyrin in headache, while Ball⁵⁹_{June 14} though affirming its value, describes a case in which, probably through idiosyncrasy of the patient, a dose of ten grains (0.65 gramme) of antipyrin given to a young lady caused in five minutes an attack of syncope, followed by intense itching of the skin and mucous membranes, and Jennings, Barber, Whitehouse, and Sturge⁷⁵_{Mar. 15} have seen urticaria, nasal and conjunctival catarrh, and even loss of consciousness caused by antipyrin.

Migraine. — In regard to the treatment of migraine many observers unite in extolling the virtue of antipyrin. Bokenham¹⁵_{Feb.} states that he has used the remedy with perfectly satisfactory results in twenty-six cases of migraine. He differs from most observers in using very small doses, giving only three or four grains (0.2 to 0.26 gramme) and repeating it once after an interval of an hour. Davies⁶_{Dec. 31, '87}, Ogilvey²_{Jan. 14}, Greene²⁶_{May 1} and Bringier¹⁹_{June 2} all bear witness to the value of antipyrin in headache. Kräpelin⁷⁵_{Jan. 3} has employed cystin (a poisonous alkaloid extracted from the seeds of *cysticus laburnum*), on account of its power to cause a contraction of the blood-vessels, in two cases of so-called paralytic migraine with most excellent results. He injected subcutaneously from one-twentieth to one-twelfth of a grain (0.0032 to 0.0054 gramme) of cystin, and in the course of half an hour the redness of the skin and the pain disappeared. On the other hand, he produced an aggravation of the pain by the subcutaneous injection of cystin in two cases of spastic migraine. Rabuske⁶⁹_{Sept. 13} in a long-standing case of intense hemicrania of the spastic variety, in which quinine, arsenic, caffeine, antipyrin, galvanism, faradism, change of climate, etc., had been tried in vain, obtained a complete cure by phenacetine given night and morning in doses of eight grains (0.51 gramme). After six doses had been taken there was entire relief of pain and the medicine produced no unpleasant effects. Tronsievitch¹⁴_{No. 35} recommends nitro-glycerine in those cases of headache or migraine due to contraction of the blood-vessels.

Haig²_{Jan. 11} claims that certain cases of migraine are closely connected, in time, with a large excretion of uric acid, and that the excretion of uric acid can be diminished by the internal

administration of acids. In accordance with these facts he has relieved many attacks of migraine by the administration of twenty to thirty drops of dilute nitro-muriatic acid in a half tumblerful of water repeated once or twice at an interval of half an hour. Batom²²⁰_{Mar.16} recommends that well-known remedy, a tablespoonful of salt, followed by a draught of water, when an attack of migraine is coming on. Little¹⁶_{June,'87} recommends the administration of twenty grains (1.30 grammes) of sodium salicylate in a wineglassful of water made effervescent by the addition of a dessertspoonful of the granular caffein citrate when an attack of migraine is felt to be impending, and the repetition of the dose once or twice at intervals of two hours if necessary. He reports several cases in which this combination was effective in cutting short the attacks. Dujardin-Beaumetz²⁷⁰_{July} recommends a mixture of caffein, sodium salicylate, and cocaine hydrochlorate. Greene¹⁵_{July} first recommended cannabis indica sixteen years ago, and it has since been used with success by himself and many physicians. He states that the effect is not merely palliative but curative, and nearly always gives some lasting relief. The dose is one-third of a grain (0.022 gramme) in pill form taken night and morning, and in severe cases may be quickly raised to one-half or two-thirds of a grain (0.032 to 0.043 gramme). It should be continued during weeks and months.

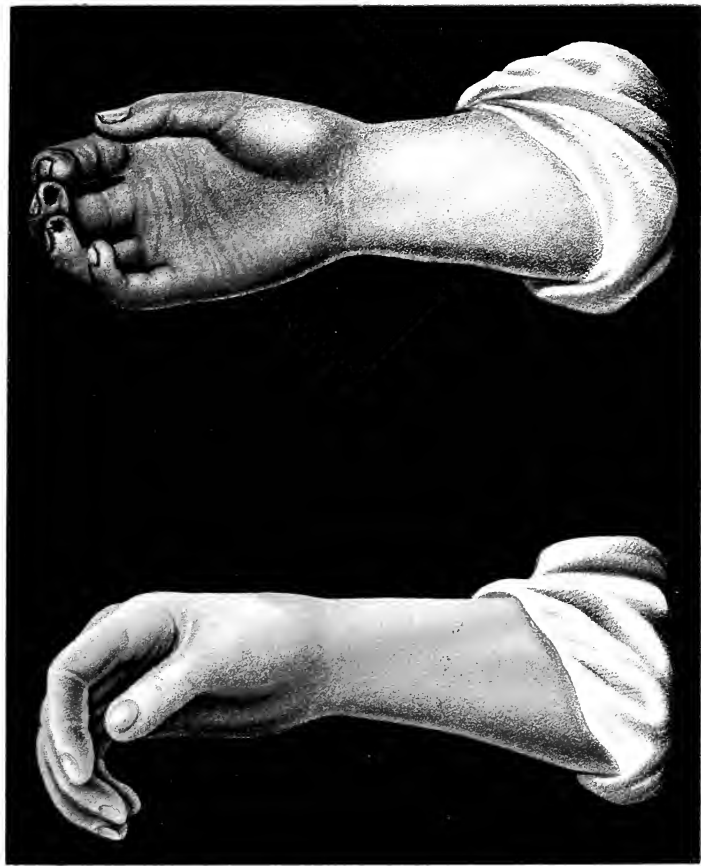
Labbé²¹_{Nov.11} reports a case of severe chronic migraine of eight years' duration which was cured by thirty-four applications of static electricity. After the first twenty-eight applications there was entire freedom from pain during three and a half months, followed by a relapse, which was relieved, and a permanent cure obtained, by six more applications, making thirty-four in all.

RAYNAUD'S DISEASE AND OTHER VASO-MOTOR DISTURBANCES.

Affleck²_{Dec.8} reports two cases of Raynaud's disease. The second case was such a typical one that it will be well to briefly describe it. A kitchen-maid, aged sixteen, entered the hospital, stating that during six months she had been subject to severe pains in her hands and feet, very severe for eight days before entrance. The pain soon left her feet, but became worse in her right hand, the tips of all the fingers of which were blanched. On entrance the fingers of the right hand, especially their second and third

phalanges, were blanched and corpse-like, and their tips of almost stony hardness. There was great pain, and, at the same time, anaesthesia of the hand. The left hand presented the same appearances in a milder form, and the toes were painful but appeared normal. Physical examination of the patient revealed nothing abnormal, except that no brachial, radial, nor ulnar pulse could be felt in the right arm; the right subclavian and axillary arteries were smaller than the left and the circumference of the right arm and hand was about half an inch smaller than that of the left. The arm was wrapped up in warm opium fomentations, and after that, whenever these were removed, the hand at first appeared blanched but very soon became purple, and so painful that the fomentations had to be reapplied. In the accompanying plate the appearance of the hand is shown. In Fig. 4, on the tip of the middle and ring fingers, a dark spot is represented, which appeared three days after entrance into the hospital, and eventually sloughed off. The patient improved and left the hospital, but no pulsation could at any time be felt in the right arm. In the other case there was no clear history of the stage of ischæmia of the skin, both feet being attacked instead of one hand, and the gangrene, as can be seen from the accompanying plate, being much more extensive, and, indeed, making necessary a Syme's amputation of the left foot. An examination of the nerve-trunks in the amputated foot showed that they had suffered extensively from neuritis. In connection with the neuritis found in this case it may be well to recall the fact that Pitres and Vaillard,⁴¹⁰_{Jan. 85} found neuritis of the affected parts at the autopsy in two cases of Raynaud's disease. Van Santvoord,⁵⁹_{Jan. 14} Palmer,^{462 Weaver,⁶_{Nov. 3} Russ,²²³_{Mar., Apr.} Hösslin,³⁴_{Feb. 7} and Leichtenstern,⁴¹_{Jan. 12} all report cases of Raynaud's disease; and Smith-Shand,²_{Feb. 18} Steiner,⁶⁹_{Jan. 29} and Veeder,⁹_{Apr. 29} report cases in which the gangrenous spots were not situated in the fingers or toes, but in other parts of the body, especially on the extensor surface of the forearm and below the knee.}

Morvan's Disease.—Monod and Reboul,³⁶⁰_{July} describe a typical case of that rare disease, "*paralysie analgésique*" or "*parésie-analgésie*" [*maladie de Morvan*], which was first described by Morvan in 1883, and of which only twenty-one cases have been published. The patient was a male, aged fifty-six, in whom the disease commenced with numbness and analgesia of the little finger of the right



Peculiar appearance of hands in a case of Raynaud's Disease (Af Heek).

British Medical Journal.



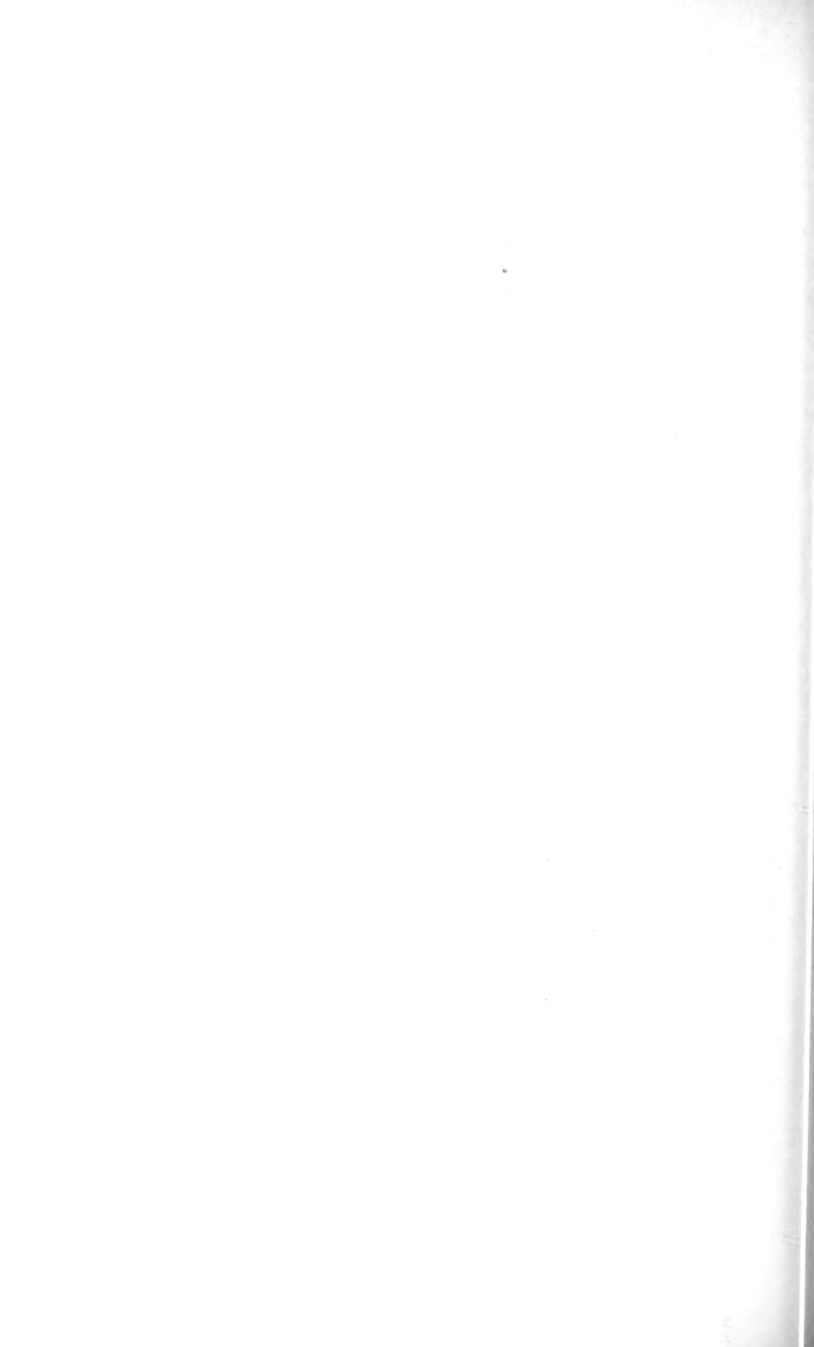
hand, followed by a weakness of the flexors and extensors of the fingers and by an atrophy of the muscles of the right hand. A year later analgesia of the left hand appeared; a few months later there developed suppuration on the right middle finger and necrosis of the second phalanx. On careful examination there was found extensive atrophy, paresis, and anæsthesia of both hands and feet, trophic disturbances of the skin and nails, a number of ulcerations, and a perforating ulcer on both feet. The knee-jerk was normal on the right side, weakened on the left. There was no ataxia nor Romberg's symptom, nor lancinating pains, nor paresis of the muscles of the arms or legs. A series of amputations were rendered necessary by constantly recurring ulceration and necrotic processes. The anæsthesia gradually extended over the thigh and upper arm and appeared also in the face. The tendon reflexes in the arms were exaggerated and a slight ankle-clonus was present. Vision, smell, and memory were impaired. The patient moved his arms and legs strongly. No arthropathies. Legs always felt cold. Localized sweating on head and neck. The microscopical examination of the nerves of the amputated fingers revealed a severe parenchymatous and interstitial neuritis. Morvan's disease, or "paréso-analgésie," is, therefore, only a variety of peripheral neuritis. Very many of the patients who suffer from this disease are compelled by their occupation to handle fish, which may throw some light on the etiology of the disease. Jamain²¹¹_{Mar. 14} reports the case of a woman, aged sixty-five, who ten months before had experienced an acute pain, soon followed by an erythema in the two last fingers of her left hand, all of which rapidly ceased under the influence of carbolic acid baths. Six weeks ago a purplish redness reappeared and was accompanied by an ulceration of the ring finger. The pains reappeared and extended into the arm and then to the shoulder. The symmetrical part of the left foot presents an analogous reddish zone. There is no anæsthesia but rather a little hyperæsthesia. He considers the case to be an example of a trophic lesion, dependent on a neuritis, and analogous to the "paréso-analgésie" of the superior extremities described by Morvan.

Angio-Neurotic Œdema.—Osler⁵_{Apr.} reports a case of hereditary angio-neurotic œdema and gives a brief account of the disease, the principal points of which he summarizes as follows: 1. The

occurrence of local swelling in various parts of the body, face, hands, arms, legs, genitals, buttocks, and throat. In one instance, possibly in two, death resulted from a sudden œdema glottidis. 2. Associated with the œdema there is almost invariably gastro-intestinal disturbance, colic, nausea, vomiting, and sometimes diarrhœa. 3. A strongly marked hereditary disposition, the disease having affected members of the family in five generations.

SPASMODIC DISORDERS—INFANTILE CONVULSIONS.

Simon³_{Feb.15} publishes an interesting clinical lecture on infantile convulsions. These can be divided, according to him, into three classes: (1) in which the convulsions attack children who are already hemiplegic and present contractures; such are cases of symptomatic epilepsy due to gross cerebral disease; (2) convulsions occurring in idiotic or imbecile children; (3) convulsions occurring in young children not dependent upon any organic lesion of the nervous centres, but resulting from some temporary accident. The convulsions belonging to the third class he considers at length and divides them into internal (spasm of the glottis) and external (the ordinary eclampsia of infants). The most common cause of the latter is disturbances in the alimentary canal, irritation due to foreign bodies in the ear or nose, irritation of the skin, such as burns and blisters, or the irritation of the testicle retained in the inguinal canal. Among the other causes are the acute fevers, hæmorrhages, poisons, and cerebral congestion. Besides these exciting causes there is necessarily a predisposition on the part of the patient, either inherited or acquired under bad hygienic conditions. In regard to treatment the physician should inform himself as to the secretion of urine, which is either suppressed or very scanty in the eclamptic state; so that if urine is passed abundantly it is a sign that recovery is at hand. Inasmuch as the eclampsia is usually due to intestinal disturbance, it is advisable to commence treatment by a purgative enema, followed by the production of vomiting by irritating the fauces or by syrup of ipecac. If the attack continues, it is necessary to resort to inhalation of ether or chloroform or to enemata of chloral hydrate, followed, if necessary, by a mustard bath, or finally by a blister on the neck. In case the cause of the convulsion is uræmia leeches should be applied behind the ears. After the convulsion is over the child should be



given potassium bromide. Grancher,⁵⁵ after reporting two cases of infantile convulsions, give a valuable review of the etiology and treatment of this affection. Coutts⁴⁶² shows as the result of an analysis of sixty-eight cases "that children who suffer from infantile convulsions are prone to neuroses in later life in a degree out of all proportion incidental to the more fortunate ones who escape them." Novi³⁷⁶ proves experimentally that one cause of convulsions is an increased specific gravity, or too great concentration of the blood. Rittenhouse¹¹⁵ reports two cases of convulsions in children promptly relieved by the subcutaneous injection of one forty-eighth of a grain of morph. sulph. (0.0014 gramme), given once in one case and three times at intervals of twenty minutes in the other.

TETANY.

Hoffmann,³²⁶ in connection with a report of fifteen cases of tetany which he has observed, gives an excellent summary of our knowledge of this disease, which, according to him, is especially prevalent among shoemakers, seamstresses, writers, and, in general, those who in their work hold their fingers in the position characteristic of tetany. The extirpation of the thyroid gland he regards as one of the causes of the disease. In one of his cases the spasm lasted two days, and in all it was bilateral. The electrical and mechanical excitability, not only of the motor, but also of the sensory nerve-fibres, is increased. Compression of a nerve produced an attack in only one case, but compression of the main artery of a limb (Trousseau's symptom) produced an attack in every case. He considers the disease a neurosis, there being no characteristic changes found in the nervous system after death. Potassium bromide, morphia, and galvanism produce the best results in this disease. Frankl-Hochwart,³²⁶ studied the mechanical and electrical excitability of the nerves and muscles in nineteen cases of tetany and found that the nerves almost invariably (in eighteen out of nineteen cases) showed an increased excitability to the galvanic current, while they often showed only a normal excitability to the faradic current. The muscles very frequently, but not constantly (in fourteen out of seventeen cases reported), showed an increased excitability to the galvanic current. A decidedly increased mechanical excitability of both nerves and muscles (greater in the nerves) he found invariably in tetany, and

frequently in persons not suffering from tetany. Hun reports a case⁹_{Oct. 13} which, if it is a case of tetany (as seems probable), and not one of hysterical contraction, is remarkable in that a spasm of great intensity affected all the muscles constantly during weeks and months, occasionally interrupted by a more or less local spasm of still greater intensity. Kirk¹⁰_{June 16} reports an interesting case of tetanic spasms occurring during lactation in a woman in the early stages of myxedema, and Schotten¹¹_{Nov. 14} reports a case of tetany, following scarlet fever, in an eight-year-old boy. (See Section M, Vol. III.).

CHOREA.

Koch³²⁶_{Bd. 49, II. 5 & 6} publishes the results of a very valuable study of two hundred and sixty-seven cases of chorea, one hundred males and one hundred and sixty-seven females. Chorea occurs most frequently between the ages of seven and thirteen years, and in the winter months, especially (22 per cent.) in December. In regard to etiology, heredity is of little significance, a strong psychical excitement being the apparent cause in 22 per cent., an association with rheumatism in 18 per cent., and with valvular disease of the heart in 14 per cent. Three of these were cases of chorea of pregnancy, all being primipara, and all terminating favorably as regards the mother. Relapses occurred in 22 per cent. In four cases which terminated fatally endocarditis was found at the autopsy in all. As a result of his study Koch formulates three hypotheses as to the nature of chorea:—

1. Chorea is not to be regarded as a neurosis, for many facts suggest that it is an infectious disease.
2. The choreic virus attacks especially the cortico-muscular nerve (pyramidal) tracts, and, indeed, the cerebral rather than the spinal portion of these tracts.
3. The choreic virus is so closely related to that of articular rheumatism that either form of disease can be caused by it. Endocarditis is also closely related to chorea, and if in any case it precedes an attack of chorea the endocarditis may in that case be considered as due to the choreic virus.

The grounds on which these hypotheses are based, and which are in part of a convincing nature, must be read in the paper of Koch. It is interesting to compare the results at which he arrives with the report of the English Committee, as noted in the ANNUAL for 1888.

Peiper⁶⁹_{July 26} discusses the relationship of chorea to rheumatism and to endocarditis. As a result of careful examination of thirty cases of chorea he finds that in fourteen (46.6) the chorea is associated with rheumatism or endocarditis. In eight cases it followed an attack of acute articular rheumatism, in one it appeared during the rheumatic attack, while in four the interval between the rheumatism and chorea was less and in three greater than a year. In six cases the chorea was complicated with valvular disease of the heart, in four cases of the mitral, in two of the aortic valves. He alludes to the fact that there may be valvular disease without any physical sign of it, and in this connection refers to Osler's report⁵_{Oct. 85} that at the autopsy of one hundred and fifteen cases of chorea terminating fatally the cardiac valves were found normal in only ten, although, not infrequently, there were no symptoms of the cardiac lesion in these cases during life. Porter,²_{Apr. 7} as the result of his experience, considers that there is a close relationship between chorea, rheumatism, and endocarditis. Comby,¹⁵²_{Feb. 4}⁷³_{Apr. 21} on the other hand, after a study of only sixteen cases of chorea, denies that there is any relationship between chorea, rheumatism, and endocarditis, and indorses the statement of Joffroy,⁷³_{May 8} who defines chorea as "a cerebro-spinal neurosis of development, a disease of growth; chorea is to the nervous system what chlorosis is to the circulatory system."

Sturges⁶_{Sept. 29} publishes an interesting clinical lecture on the birth and parentage of one hundred children with chorea. He finds that there is a family history of rheumatism in 25 per cent. of the cases and a personal history of rheumatism in about the same percentage; that there is a neurotic family history in 22 per cent., and that in about 65 per cent. there is a close connection with personal mental shock or strain. In regard to the location of the muscular movements, he finds that the parts which suffer first and most are the same as are used to express emotion and subjected to the highest, longest, and most complicated training. Dana⁵¹_{Apr.} summarizes one hundred and thirty cases of chorea which he has observed, and finds that the disease is most frequent between the ages of five and fifteen years, and that it occurs most frequently in the spring months, next to which come the fall months, then the winter months, and last the summer months. In 12 per cent. one or both parents were of nervous temperament, and in 8 per cent.

one of the parents was rheumatic. In only seven cases was there a distinct rheumatic history. In eight cases there were mitral regurgitant murmurs; in two functional hæmic murmurs. In fifteen cases the cause assigned was fright or mental shock; in two over-study, in three rheumatism, in two measles, in one scarlatina, in three ague, in one matrimony, and in two it was a chorea of pregnancy. In thirty-three cases the right, in twenty-four cases the left, side was affected. When a relapse occurred soon after the first attack, the opposite side was generally involved. Thirty patients had more than one attack, and one of them had seven. In regard to treatment Dana recommends the careful daily anodal galvanization of the brain, a current of from one to three milliam-pères being employed. He corroborates the general testimony as to the value of arsenic, although in some cases zinc bromide acts better. Hyoseyamin acted very well in three of six cases, as did also helenine. Herringham⁴⁷_{Apr.} publishes an interesting critical digest of chorea in the adult and in the old. Snow¹⁷⁰_{Nov.} and Merz²⁰²_{Oct.10} publish a summary of our knowledge of chorea.

Schweinitz,¹_{June 23} from an examination of the eyes of fifty cases of chorea of childhood, draws the following conclusions: 1. The irides of choreic children quite commonly present chromatic asymmetry in shade, just as the same condition has been found in other forms of nervous disorders. 2. Slight differences in the width of the pupils may be observed, but not more frequently, in fact not as frequently, as these have been noted in perfectly healthy individuals. 3. Facial asymmetry is present in about one-half of the cases, just as in cases of high refractive error, and also in individuals perfectly free from nervous disorders. 4. Hypermetropia and hypermetropic astigmatism are vastly the preponderating conditions of refraction in the eyes of choreic children, being found in about 77 per cent. of the cases, exactly as hypermetropic refraction is the preponderating condition in childhood generally, being found in 76 per cent. of the eyes of children in the elementary school years. 5. Imperfect equipoise of the eye-muscles is found in the great majority of the cases, but imperfect equipoise of the eye-muscles is very frequently present in the eyes of school-children free from chorea or neuropathic tendencies. 6. Embolism, atrophy of the disk, and optic neuritis may occur during or after attacks of chorea, but appearances in the fundus oculi character-

istic of the disease have not been found. 7. The refractive errors and muscular defects in these children should be carefully and fully corrected by glasses and by prisms when necessary, or even by judicious surgical interference, and thus a probable exciting element removed, just as we should perform the same service for eyes similarly afflicted in children who are not choreic. Evidence, however, seems quite as lacking that hypermetropic refraction is the basal cause of chorea, as it is that the chorea is the cause of the hypermetropia.

Cook and Beale²_{Apr.14} report the case of a girl, aged nine years, who suffered from a severe attack of chorea, presenting a very rapid pulse and a slight elevation of temperature, and terminating fatally in five days. At the autopsy a recent endocarditis of the mitral and tricuspid valves was found; the brain and upper part of the spinal cord appeared normal, except for an extreme degree of anæmia of pons and medulla. Sturges⁶_{Jan.21} reports a case of chorea in a child under three years of age, but inasmuch as in this case the disease had its probable origin in a fall on the head, followed by convulsions, and as there was paralysis of the right arm and inco-ordination of the left, the diagnosis of chorea is not free from doubt.

Sym³⁶_{Mar.} describes the case of a seventeen-year-old boy, who, during his convalescence from a mild attack of chorea, became suddenly blind in the right eye. There was found, on ophthalmoscopic examination, a total atrophy of the right optic nerve, and an examination of his heart revealed a stenosis of the mitral orifice. He considers that the original cause of the blindness was an embolism of the arteria centralis retinæ, and says that Argyll-Robertson has told him of a similar case. Nauwyn⁶⁵¹ reports a severe case of chorea in a girl seventeen years old, in whom, after death, there was found a recent endocarditis on both mitral and aortic valves, and the pia mater in the region of the optic chiasm and along the fossa of Sylvius exhibited a reddish-brown color, which on microscopic examination was found to be due to a fungoid growth. The fungus belonged to a species between cladothrix and leptothrix, and the same fungus was found in the vegetations on the cardiac valves. In this case it appears as though the fungus had been the cause of the chorea. Stephan⁵⁸³_{Nov.2,87} records the case of an unmarried woman, aged forty-four years, who, four

years before her death, suddenly became hemiplegic on the left side, and who, during the last two years of her life, exhibited choreic movements of the left (paretic) side, and during the same time suffered from an intolerable itching, which, as no cause could be found for it, was supposed to be of cerebral origin. Sensibility was not impaired. There was no muscular atrophy and no alteration of the electrical reaction of the muscles. She died comatose, and at the autopsy there was found a sclerosis of the left crossed pyramidal tract in the spinal cord, which could be traced upward to an old area of softening in the right corpus striatum, involving the anterior part of the internal capsule. Gassicourt,²¹_(Oct. 22) reports two interesting cases of paralytic chorea. Koppen,²⁶⁸_(Feb. 19, 1911) reports six cases of insanity which were associated with choreic movements.

Habit Chorea.—De Schweinitz,¹_{June 23} reports seven cases of "habit chorea," in six of which there was either hypermetropia or hypermetropic astigmatism. In five of these cases the errors of refraction were corrected and the patients were rapidly cured, but in one instance the patient refused to allow the error of refraction to be corrected and the habit continued. The seventh case was emmetropic, but there was phlyctenular conjunctivitis and spasm of the muscle of accommodation, and when this latter condition was relieved by atropine the patient improved rapidly.

Imitative Chorea.—Schreemann,⁶⁹_{Aug. 9} reports an interesting case of imitative chorea. The patient, a chlorotic girl, amused herself by imitating the actions of a choreic patient, but soon found that she was unable to stop the motions, which she had at first made simply in the way of imitation. From this time she suffered from a typical attack of chorea, which even under very active treatment continued for about a month. Schwarz,⁶²²₅₇ mentions the interesting case of a young girl who was attacked by chorea, and whose mother, who had tenderly nursed her, was soon afterward attacked by a general chorea. In the course of several weeks the choreic movements of the extremities ceased, and the contractions were limited to the domain of the right facial nerve, where they assumed a more tonic character. There then slowly developed a paresis of the right facial nerve, followed by a hemiparesis of the right side, combined with apathy, dementia, and aphasia, and about two and a half months after the first symptoms appeared the patient

died. No autopsy. Schwarz is strongly of the opinion that the chorea of the mother was an imitative chorea and attempts to explain the transition from the functional to the organic disease, but his efforts in this direction do not appear very satisfactory.

Senile Chorea.—Suckling⁶_{May 5} reports the case of a woman, aged sixty-two years, who had suffered from chorea for nine years. She had had an attack of chorea at the age of twelve years, from which she made a complete recovery in three months. She had an attack of rheumatism at the age of fifty-five years. The intellect was unaffected, and no family history of any importance could be obtained. Foerster¹_{Feb. 11} reports the case of a woman, aged seventy-six years, in whom an attack of right hemichorea came on during an attack of articular rheumatism. The movements were very violent, but a permanent cure was obtained in twelve days under frequently repeated doses of ten grains of chloral hydrate. Dodge⁹_{July 28} reports a case of left hemichorea in a man aged seventy-five years, which was followed by a sudden attack of right hemiplegia, which did not, however, affect the left hemichorea, which continued unchanged; and Sollier⁷_{May} records the case of a man aged seventy-eight years, who, during the last two years of his life, in consequence of a fall, had a hemichorea, and at the autopsy no lesion of the central nervous organs could be discovered.

Chorea of Pregnancy.—Dodge⁹_{July 28} and Hirst⁶¹_{Feb. 11} report interesting cases of the chorea of pregnancy in which the choreic movements were very violent, were limited to the left side, being especially strong in the arm, and persisted for several weeks after the birth of the child.

Hereditary Chorea.—Much of interest has been published during 1888 on the subject of hereditary chorea. Hoffmann²⁰_{Mar. '87} reports in full four very interesting cases—two brothers, a sister, and a female cousin. All were attacked between the age of thirty to forty years except one, who developed the disease while at school, having had epilepsy since infancy. The family history is briefly as follows: Two men of the oldest generation were probably affected by the disease. Next, the grandfather, Walldi, was choreic for several years before his death. Three of his nine children were choreic. The first was attacked at the age of forty and became weak-minded. One of her two children became choreic at ten, developed imbecility later, and died at nineteen.

Another of Waldi's children showed signs of chorea at thirty, and later became insane. She had nine children, of whom three were the first three patients mentioned, and two others were attacked by the same disease at the ages of thirty and forty respectively. A third choreic child of Waldi's son exhibited the first symptoms at thirty-eight. There was no mental disturbance. His daughter is the fourth of the choreic patients whose case is detailed. The disease, therefore, extended through four generations and attacked thirteen persons. None of the children of the fifth generation exhibit symptoms, but none is over twenty-four years old. Two of the cases prove that the statement of Huntington is incorrect, that the disease "never begins in youth." Cases of Peretti's confirm this, while some of Huber's show that it may commence after forty years of age.

The disease begins as does chorea minor, but grows slowly and progressively worse and does not end in recovery. The chorea is not made worse by intended movements. Failure of mental power develops later in nearly all cases. If one generation escapes, the disease ceases to occur. The choreic movements are extreme, affecting nearly the whole voluntary muscular system, and usually cease during sleep. In advanced cases there is some loss of muscular power and occasionally of sensibility to pain. Hoffmann then reports the case of another patient who developed chorea at forty and epilepsy at fifty, and whose mother and three sisters had been epileptics. He believes that it is undoubtedly an instance of chronic chorea, and that the absence of psychic disturbance proves nothing to the contrary, since a case of Ewald's exhibited the same peculiarity. As regards the "heredity," it would seem that epilepsy had taken the place of chorea in the predecessors. This epilepsy differed from the usual hereditary form in that it did not develop in youth, but between twenty-six and fifty years of age. It is interesting to note that in this case chorea followed epilepsy, while in one of the others, as already stated, the order was reversed. The author then discusses the association of chorea with other nervous diseases. Since this fourth case proves an exception to the rule of inheritance, he prefers the title "*chorea chronica progressiva*." He is inclined to consider that the seat of the disease lies in the medulla oblongata, but meningitic lesions and cortical atrophy, similar to those of general paresis, have

been found. Lannois ⁹²_{Aug.10} reports chorea of the hereditary form in a brother and sister and gives a very complete and interesting summary of the cases of this disease already published. Klippel and Ducellier ¹⁸_{Nov.,Dec.} report a typical case of hereditary chorea and give a bibliography. Huber ²⁰_{Ed.105,H.2} reports a case of chronic progressive chorea in which after death there was found an internal pachymeningitis and leptomeningitis in the cervical region. Zacher ⁷⁵_{Jan.15} records the case of a man, aged forty-five years, who was committed to an asylum after having showed great irritability of temper, abused his wife, and had several temporary attacks of great violence, in which he destroyed everything within his reach. Besides his mental derangement he exhibited choreic movements of all the muscles of his body of such severity that it was barely possible for him to walk and his speech was much affected. By an effort of the will he was usually able to cause a temporary cessation of these movements and even to write his name; on the other hand, when he was excited the movements became very violent and uncontrollable. During sleep the movements ceased. Sensibility, reflexes, and electrical reaction of the muscles were normal. On investigation it was found that many members of his family had been attacked by the same disease, and it was possible to trace it through three generations, and of those cases in which accurate information could be obtained the disease made its appearance between the age of forty and forty-two years in all.

Treatment.—Many observers unite in testifying to the value in chorea of the old remedy, arsenic, provided that it is given in large doses. Of the newer drugs that have been recently proposed, antipyrin seems to be the favorite. Its value has been confirmed by many observers during the year. Moncorvo, of Rio de Janeiro, corresponding editor, was one of the first to use the drug in the treatment of chorea and considers it of great value.

Legroux ¹¹⁸_{Mar.} mentions that Volner ³⁴_{Feb.1,87} cured a severe case of chorea by antipyrin, and himself reports six cases of chorea in children which he cured rapidly (in the shortest case in six, in the longest in twenty-seven days) by the administration of fifteen grains (1 gramme) three times a day. Négrié and Dumur ¹⁸⁸_{Aug.5} report seven cases of chorea which were cured in from six to fourteen days by antipyrin, forty-five grains of which was given daily without any bad effect. Boussi, ¹⁵²_{Feb.2} Laurencin, ²¹¹_{Mar.11} Wood, ⁸¹_{Apr.} Grün, ⁶_{Jan.21} Anderson, ²¹³_{May}

and Lilienfeld¹¹⁶_{Apr.} all report cases showing that antipyrin is of great value in the treatment of chorea, and in many cases produces surprising results. It seems advisable to refer in this place to the caution in regard to the use of antipyrin in headache expressed in another portion of this review.

Corning⁵⁹_{Jan.7} advocates the treatment of chorea by cerebral rest. The patients should be urged to get as much sleep as possible, and in many cases they can acquire the habit of sleeping sixteen hours a day. If natural sleep cannot readily be obtained bromides should be given. He also recommends the employment of Fowler's solution in increasing doses and the application of galvanism and ice-bags to the head.

Eserine has been strongly recommended in the treatment of chorea by Riess (see ANNUAL for 1888), but Lodderstädt⁴_{Apr.23} reports a case of chorea in a child, aged nine years, in which a subcutaneous injection of $\frac{1}{120}$ of a grain (0.0005 gramme) of eserine sulphate caused profuse sweating, followed by vomiting, an extreme degree of collapse with a scarcely perceptible pulse of fifty-four per minute, and greatly diminished pupillary reflex. Under strong stimulants the patient recovered completely from the collapse only after seven hours. This experience certainly calls for great caution in the use of the drug.

ATHETOSIS.

Not much has been added to our knowledge of athetosis during the year 1888, although a number of cases have been reported.

Macaldowie⁴⁷_{July} describes the case of a married woman, aged sixty-two years. The left hand, forearm, and arm were the seat of slow rythmical movements affecting chiefly the extensor muscles. These usually occurred in cycles. At the beginning of the cycle the hand rested on the lap with the fingers semiflexed and drawn together, the wrist dropped, and the elbow semiflexed. The three inner fingers then extended and separated by slow rythmical movements till a position of hyperextension was attained. The hand was then drawn backward and toward the ulnar side in the same manner, and the movements gradually spread up the extensors of the forearm and arm until the limb was stretched almost horizontally behind the patient as she sat in the chair, with all the joints, except those of the thumb and index finger, fully extended, the three inner fingers widely separated, and the palm

directed upward, backward, and inward. After remaining in that position for ten to fifteen seconds, during which the slow rhythmical movements continued, the cycle was completed by a series of movements almost exactly the converse of the preceding, till the hand regained its position on the lap. The thumb and index finger was scarcely, if at all, affected, but remained slightly flexed and pressed together. She was able, by an effort of the will, to check these cyclic movements at any period, but was unable to prevent the fingers from performing the peculiar movements and contortions characteristic of athetosis, which did not altogether cease even in sleep. Deep reflexes were obtained on percussion over the ulnar side of the forearm. The superficial reflexes were markedly increased. Tickling the skin in front of the forearm produced tonic contraction of the portion of the flexor muscles supplying the three inner fingers, which were shut and pressed firmly against the palm. Tickling the skin on the back of the forearm, on the contrary, appeared to affect the extensor minimi digiti alone, the little finger standing rigidly out from the rest in a state of hyperextension. The electrical excitability of the affected muscles was increased. The knee-jerk appeared exaggerated on both sides. The patient suffered from constant pain over the right parietal region, which was tender on percussion. She was treated at first with potassium bromide, afterward with arsenic, and blisters were applied behind the right ear. The movements gradually ceased, and she was quite well in three weeks and had no relapse. Pengra⁹⁹_{July 26} and Greenlees⁴⁷_{Jan.} report peculiar cases of athetosis. Remak⁷⁵_{July 1} and Renault³_{May 2} report cases of post-hemiplegic athetosis. Comby¹⁴_{No. 7} reports the case of a girl, aged twenty months, who had been suffering since the eighth month of her life with hemiathetosis of the right side. The onset of the athetosis was marked by violent convulsions, which lasted several days. Bourneville and Pilliet report two cases of double athetosis occurring in imbeciles, and Blocq and Blin⁹²_{Jan.} record a case of double athetosis. Prof. Takaki reports a case of athetosis, the second published in Japan. Like so many cases of the kind, it developed after an apoplectic attack when the patient was a child (three years old), and has persisted now for twenty-three years. The movements do not stop altogether during sleep. (From report of Prof. Baelz, corresponding editor, Tokyo, Japan.)

PARAMYOCLONUS MULTIPLEX.

Much has been written during the year on this subject, and the tendency seems to be to enlarge the domain of this disease and to include in it cases decidedly different from those first reported by Friedreich. Seligmüller, who has given an excellent summary of our knowledge of this rare disease,¹⁰⁰⁰_{104,15} reports two examples,⁶⁹_{Dec 29, '97} which he regards as the fourteenth and fifteenth cases published. The first is that of a laborer, aged forty-one years, who fell and struck on the left side of his body, and who, soon afterward, was seized with clonic muscular spasms affecting the pectoralis major, the triceps humeri, the sterno-cleido-mastoid, the serratus magnus, and rectus abdominis muscles of the right side, and to a less degree of the left side also. These clonic spasms persisted with varying intensity and without any definite rhythm both during the day and night. They did not interfere with voluntary movements, the patient being able even to write without difficulty. In addition to these clonic spasms, most of the other muscles of the body and extremities exhibited fibrillary contractions. Electrical reaction of the muscles was normal and knee-jerks exaggerated. The patient improved rapidly under galvanism, the positive pole on the back, the negative on the epigastrium. The second case is that of an engineer, aged forty years, in whose family history there was a strong tendency to hæmorrhoids and nervous diseases, who, eleven days after having received a severe punctured wound of the right foot, exhibited clonic spasms of the trunk-muscles on the left side, and to a less degree of the muscles of the left arm and leg (left-sided opisthoclonus). These spasms, at first very violent and forty-two per minute, became gradually less severe and frequent under the application of wet cups on the loins and morphine followed by atropine internally, and in twenty-four hours were reduced to four per minute, and in a few days only a trace of the spasm could be detected at long intervals. Both of these cases followed at a short interval severe wounds, both occurred in persons who had suffered from hæmorrhoids and from previous attacks of a convulsive nature. In both cases there was much pain in the back and points of tenderness in the lumbar region, and in neither case during any of the attacks was there any loss of consciousness. Both made a rapid recovery. The unilateral nature of the spasm in

the second case makes it doubtful whether it can be considered as a case of paramyoclonus multiplex.

Fry⁶⁵_{June} reports an interesting and valuable case of myoclonus multiplex occurring in a young woman, aged thirty, who had been engaged in running a heavy sewing-machine ten or twelve hours daily during twelve years, and in whom the first attack occurred while she was running the machine, although later the attacks occurred at all times and without any exciting cause. Those muscles were always chiefly affected which were most used in running the machine, viz.: the extensors and flexors of the thighs (although in the severe attacks all the muscles of the trunk participated, involving even the muscles of the shoulders), and, consequently, during the attack the patient executed a tramping movement of considerable rapidity, her heels making a great clatter on the floor. Consciousness was not affected. Knee-jerks were exaggerated and occasionally there was a decided ankle-clonus. Both the galvanic and faradic excitability of the muscles were increased. The patient improved under treatment and chloral was found to be the most effective drug in her case.

Ziehen³⁶⁸_{Bd.19,H.2} reports three interesting cases of clonic spasm or tremor, which are analogous to, although they do not correspond closely to, the paramyoclonus multiplex described by Friedreich. Since a number of the reported cases of paramyoclonus multiplex differ widely among themselves, he considers that a number of these allied diseases, such as paramyoclonus multiplex, chorea electrica, tic convulsif, and various forms of tremor not associated with paralysis should be classed together under the general term myoclonie. Under the classification proposed by him the cases described by Friedreich would be known as paramyoclonia brachio-cruralis, tic convulsif as myoclonia facialis, chorea electrica as myoclonia diffusa. Ziehen's first case he would call myoclonia brachialis rhythmica, the symptom itself myoclonus.

Marina³⁶⁸_{Bd.19,H.3} reports two very interesting cases of paramyoclonus multiplex and arranges in tabular form all the previously reported cases. He thinks that Ziehen is right in classifying paramyoclonus multiplex, tic convulsif, chorea electrica, etc., together, but doubts whether myoclonus is the proper name to use, inasmuch as almost half the cases exhibit tonic contractions, either exclusively or combined with the clonic contractions. He therefore

prefers the name *myospasia simplex* for those forms of disease which are characterized by contractions of single muscles, in contradistinction to *myospasia impulsiva*, in which groups of muscles contract as in co-ordinated voluntary movements. He classifies most of the muscular spasms in the following way:—

Chorea (minor *athetosis*).

Myospasia simplex (*tic convulsif*, *paramyoclonus multiplex*, *chorea electrica*, *chorea laryngea*, *diaphragmatica*, *accessorius spasm*, etc.).

Myospasia impulsiva (*chorea magna*, *maladie des tic convulsifs* [*myriachit*], spasms of memory and station).

Manquat and Grasset¹⁴_{001,7,10} report a case of *paramyoclonus* which agrees with the type described by Friederich, except that the disease commenced with fibrillary contractions, followed later by clonic spasms of the muscles, that the knee-jerks were abolished or very feeble, and that there was much pain and some *anæsthesia*. To this case they append a summary of the published cases of *paramyoclonus multiplex*, from which it appears that it has occurred in nineteen men and five women. The age of the patients varied from ten to sixty-seven years. The cause assigned was fear in three cases, grief in five, traumatism in three, hæmorrhage in one, unknown in ten; hereditary predisposition to phthisis in one case, to nervous disease in six, to alcoholism in one, none in nine, unknown in eight. Condition of health was robust in seven cases, nervous in five, phthisical in one, rheumatic in one, emphysemic in one, *anæmic* in one, atheromatous in one, unknown in seven. The character of the contraction was tonic and clonic in eleven cases, clonic alone in twelve, tonic alone in one, fibrillary alone in one. In regard to the localization, the arms and legs were attacked in almost every case, the face in twelve, the tongue in seven, the diaphragm in five, nystagmus in one. The tendon reflexes were exaggerated in seventeen cases, diminished in two, absent in two, normal in one, unknown in three. Complete cessation of contractions during sleep in eleven cases, incomplete cessation in six, persistence in three. The contractions were diminished by voluntary movements in fourteen cases, were augmented in two, and were unaffected in one. The treatment adopted was generally that of electricity and bromide, and usually there was improvement or cure, although frequently there were

relapses. Kuy³⁶⁸_{Bd. 19, H. 3} reports two interesting cases which resembled paramyoclonus multiplex, as described by Friedereich, in all particulars except that the contraction of the muscles were fibrillary and the muscles were abnormally irritable to electricity. Bechterew³⁶⁸_{Bd. 19, H. 1} publishes a valuable paper on paramyoclonus multiplex, with a report of a case. Owen²_{May 29} reports the case of a girl who, at the age of three years, after scarlatina, exhibited twitchings of the muscles of the shoulders and face; at the age of eleven years the diaphragm, the recti abdominis, the erector spinæ, and the sterno-thyroid muscles also became involved. The spasm of the muscles was in appearance exactly such as occur from an electric shock. She had been treated with large doses of arsenic and electricity. In 1888 the affection had existed fifteen years, and the girl still showed the spasmodic affection of the abdominal muscles, but in a much less marked degree. Rause¹⁷_{Sept. 15} reports three cases which resemble, in many respects, paramyoclonus multiplex, and which indicate the close relationship of this disease to tic convulsif and to hysterical contractions. Moretti⁵⁹¹ gives two interesting cases of paramyoclonus multiplex and a general description of the disease, and Seppilli⁵⁹¹_{p. 397} gives a good summary of our knowledge of this disease. Minkowski⁶⁵¹ reports an interesting case of hemimyoclonus in a boy aged seventeen, who in consequence of a fright exhibited clonic spasms, commencing in the left leg, extending over the whole left side, except the face, and involving the diaphragm. The spasms were quick, absent in sleep and in chloroform narcosis, and increased by irritation of the skin, by mental excitement, and by voluntary movements. The deep and superficial reflexes were increased, and the cutaneous sensibility diminished on the left side.

TIC CONVULSIF.

Dana⁵¹_{Mar., Apr} publishes a very valuable contribution to our knowledge of chorea, spasmodic tic, and hysterical spasmodic disorders of childhood. He makes the following groups:—

1. Common chorea of Sydenham, subacute and chronic, including (a) ordinary spasmodic form, (b) paralytic form, (c) chorea mollis, (d) psychical form (?), and (e) sensory forms (?), all but (a) and (b) being very rare.

2. Tic convulsif, (1) ordinary inco-ordinated forms, including

(a) jumpers, myriachit, and latan; (b) with ecolalia and coprolalia; (c) chorea of inspiratory or expiratory muscles (chorea of larynx or diaphragm so-called), and saltatory tic; (d) affecting facial, spinal accessory, or other nerves. (2) Co-ordinate tic or "habit chorea," which includes various nervous habits of speech and gesture.

3. Hysterical (and neurasthenic) spasms, including (a) reflex saltatory chorea, (b) spasmus nutans, (c) oscillatory chorea, chorea major.

He describes briefly these various forms of spasm and reports five interesting cases illustrating some of them. He insists especially on a decided distinction being made between tic convulsif and chronic chorea.

Spasmus Nutans.—Owen²_{May 26} reports a case of this affection in a child aged nine months. The face was turned from side to side with occasional nutation. There was slight nystagmus.

Clonic Spasm.—Moyer⁶¹_{Aug 27} reports an interesting case of clonic rhythmical spasm of the pronator radii teres muscle, Dercum and Mills²¹²_{p. 512} four cases of spasm of the muscles supplied by the spinal accessory nerve, unsuccessfully treated by excision of the nerve.

Contractures.—Blocq¹⁰³⁷ has published a most valuable and exhaustive monograph on contractures, which presents, however, nothing requiring special mention.

PROFESSIONAL NEUROSES.

Poncet⁶_{Apr. 21} describes a deformity of the hands which consists in a flexion of the proximal phalangeal joint of the fingers, especially of the little and ring fingers, and which occurs very frequently in glass-blowers, who work with their fingers flexed, grasping a tube, many hours daily.

Limbeck¹¹³_{Dec. 22, '94} reports a case of writers' cramp in which massage, electricity, etc., had been tried in vain, and in which Nussbaum's bracelet, after giving relief at first, became worthless, but in which great relief was obtained by attaching to the bracelet a splint extending to the tip of the index and middle fingers and preventing their flexion. Braun¹⁵⁰_{Sept.} states that he overcame a writer's cramp from which he suffered by writing at times with the pen held in the ordinary manner, and at times held between the index and middle fingers, thus altering to a slight extent the character of the muscular movements and avoiding a cramp from too continuous and uniform muscular contraction. Henschen³⁷²_{p. 125, '97}

shows the value of massage in three interesting cases, insists on the importance of a careful examination of the nerves and muscles, which usually exhibit alterations, and regards the disease as being of peripheric origin. Graham⁹⁹_{Dec.13} reports a number of cases of writers' cramp treated by massage, in which the results were not very gratifying.

Ross²_{Nor.24} describes the case of a man who had been a clarinet-player for twenty-nine years, in whom there was a jerking action of the middle finger, due to a contraction of the extensor muscle, which interfered with his playing.

Waitzfelder⁵⁹_{Jan.7} described a case of cigarmakers' cramp which exhibited some anæsthesia of the skin and tonic spasm of the flexors of the fingers; and in the discussion following Seguin mentioned a case of waiters' cramp which came on after the patient had been carrying plates after the manner of his class for fourteen years, and which was so severe that he broke dishes and spilled their contents on the guests.

Somewhat, but not closely, analogous to these professional neuroses are the inflammations of muscle, joint, and bone resulting from strain or bruise which Leuf describes as occurring in foot-ball players⁵⁹_{Dec.1} or in base-ball pitchers.⁹_{July 28}

DUPUYTREN'S CONTRACTION.

Rinné⁶⁹_{Sept.13} reports a case of Dupuytren's finger contraction which followed, at an interval of a half-year or more, a fracture of the radius at the wrist. Abbe⁵⁹_{Mar.3} states that a wider experience only confirms his views already enunciated in 1884, that Dupuytren's finger contraction is due to a slight traumatism of the palm, often entirely forgotten, which produces a spinal impression and a reflex influence to the part originally hurt, producing insensible hyperæmia, nutritive-tissue disturbances, and new growth, shown in the contracting bands of fascia and occasional joint-lesions resembling subacute rheumatism; through the tense contractions a second series of reflex neuralgias, general systemic disturbances, and a reflection of the trouble to the corresponding part of the opposite hand. He reports several interesting cases tending to support this hypothesis. Trélat⁶⁵_{Jan} recommends an operation which consists in subcutaneously freeing the adhesions between the skin and the contracted band, and in subcutaneously dividing

the contracted band of fibrous tissue, so that the finger can be straightened.

TREMOR.

Häbler⁴_{Oct. 15} reports an interesting case of a man, aged sixty-four years, in whom tremor occurred in a number of members of his mother's side of the family, and who from boyhood suffered from a tremor of his forearms and hands. In sleep, with his arm resting on a table and his head on the arm, he once produced a mild pressure paralysis in his right arm. Two applications of the faradic current cured this, and at the same time the tremor disappeared permanently from the right hand and forearm, although it persisted in the left.

Edgar²²_{Oct. 24} reports the case of a miner, aged sixty years, who ten months previously had been partly suffocated by "choke damp," from which he was unconscious for twenty-four hours. This was followed by a trembling of small amplitude affecting the head and arms, which at first persisted during the day and night, but which later ceased at night. This trembling was slight when the patient was at rest, but was increased by voluntary motions. Under a treatment of three grains monobromide of camphor and half a grain of extract of belladonna three times a day the patient recovered in less than a month.

Letulle¹⁵²_{Nov. 8} reports a curious case of tremor occurring in a man who for many years had been exposed in his work to the fumes of mercuric nitrate. The trembling was confined to the hours when he was not at work. While at work one day he was suddenly attacked with a violent tremor and was taken to the hospital. This tremor was coarse, arrhythmical, rapid, and midway between the tremor of multiple sclerosis and chorea. It was more marked when the patient attempted to perform a voluntary movement. Certain peculiarities both of the tremor and of the patient appeared to be hysterical. He was permanently cured in three days by the alternate application of an elastic ligature and a magnet. This certainly seemed to be a case of hysterical trembling, and as a result of his observation of this and other cases Letulle considers that mercurial tremor is a hysterical manifestation.

Gauthier²¹¹_{Nov. 29^{pt.}} publishes a paper on paralysis agitans and draws the following remarkable conclusions:—

1. Paralysis agitans does not present the characters of a

neurosis. The symptoms are exclusively disorders of the muscular system and originate from the muscular rigidity.

2. This rigidity, a principal symptom in the disease, is produced in the muscles without the intervention of the nervous system; it is properly idiomuscular. It may be due to the phosphaturia usually present in paralysis agitans.

3. This phosphaturia may be due to the muscular fatigue, and would, therefore, be a muscular rather than a cerebro-spinal phosphaturia.

4. Paralysis agitans may, therefore, be regarded as a dystrophy of the muscular system.

These four conclusions certainly require much more proof than has been offered before they can be accepted.

THOMSEN'S DISEASE.

Dana ⁵⁹_{Apr. 21} reports a case which clinically presented the symptoms of Thomsen's disease, although it did not make its appearance in this patient till the age of twenty years and had been preceded by a talipes. Until recently he had had a high-pitched child's voice and a child's larynx. Erections were incomplete, and there was mental difficulty in concentrating his thoughts. There were tonic contractions of the calf-muscles and of the pillars of the fauces. Striking the muscles of the arm or forearm caused tonic contractions in these muscles. There was no increase of irritability to mechanical stimulation in the nerves. To galvanism and faradism there was increased muscular irritability, and a closure tetanus both to the negative and the positive pole, and no opening contraction to either pole. A peculiarity of the reaction to faradism was that in the arm the contractions persisted after the current ceased to pass. An examination of a piece of the supinator longus muscle, removed during life, showed an increase of the nuclei of the sarcolemma and a dichotomous division of the fibres. As Dana says, "The case here reported is certainly not a typical case, but it does present certain typical symptoms and typical electro-muscular reactions. The history points to some central lesion of a hereditary degenerative character. In some respects the patient suggests a case of pseudo-hypertrophic paralysis and in others hereditary ataxia. Such a case is highly instructive as showing the kinship of the true myotomia congenita to other

primary degenerative disorders." Blumenau⁷⁵_{p.679} reports a typical case of Thomsen's disease in which he studied especially the electrical reaction of the muscles. The mechanical, the faradic, and especially the galvanic excitability of the muscles was increased, while that of the nerves was not. The galvanic electrical formula was normal, but the latent period and the duration of the muscular contraction were both longer than normal.

Frankl-Hochwart¹¹⁴_{Bd.14,H.5,6} publishes an interesting account of volitional spasm, "intentions krämpfe," which is the characteristic symptom of Thomsen's disease. He refers to the cases already published by various observers, in which this symptom occurred in connection with nervous diseases other than Thomsen's disease, and reports at length two cases under his own observation, one a case of dystrophia muscularis (Erb), the other a case of locomotor ataxia combined with muscular atrophy, in both of which the symptom of volitional spasm was well marked.

NEURASTHENIA.

Arndt¹⁰⁰⁰_{Bd.14} gives an excellent summary of our knowledge of neurasthenia. Gray¹_{Oct.20} has published a valuable paper on neurasthenia, of which he recognizes three forms—reflex neurasthenia, so-called lithæmic neurasthenia, and simple neurasthenia. Each of these he briefly describes and gives suggestions in regard to diagnosis and treatment. Fothergill⁵⁹_{Jan.7} and Rockwell¹_{Feb.18} both present suggestive papers on lithæmic neurasthenia, and the latter attempts to give a differential diagnosis between lithæmia and neurasthenia. Wagner²¹¹_{Apr.15} speaks of the tendency now showing itself in medicine to class under the head of neurasthenia, hysteria, hypochondriasis, melancholia, etc., and insists on the fact that neurasthenia does not constitute a disease, but rather a condition of exhaustion of the nervous system which may be present in a number of diseases. In addition to prophylactic treatment, when that is possible, he recommends change of surroundings, isolation and rest, and electricity in the form of electric baths. Finkelnburg⁷⁵_{Oct.1} considers that the term neurasthenia is too broad, and suggests that it be subdivided into two sub-classes: (1) exhaustion of the power for work (torpid form); (2) exhaustion of psychic inhibitory powers (erythistic form). The first form occurs after infectious diseases and in melancholic and hypochondriacal persons.

It is a pure cerebral asthenia, and he suggests for it the name "phrenasthenia." It occurs also as a consequence of mental over-exertion; while for the production of the second form there is needed, in addition, an irritation of the emotional sphere. The second form is characterized by inability to restrain the expression of the emotions, by a want of self-restraint, and by disturbances in the functions of the spinal cord and of the vasomotor system. Sexual excesses produce the first form in men and the second form in women. In the treatment of the first form it is merely necessary to remove the injurious causes, but in the second form an active treatment is necessary. Webber⁵⁹_{May 5} has made a study of arterial tension in neurasthenia by means of the sphygmograph, and finds that neurasthenic patients may be divided into three classes: (1) those in whom the vascular tension is nearly or quite normal and who quickly recover; (2) those who show a decided loss of vascular tone and who, after a course of treatment, regain a normal tension, and who usually recover in a longer or shorter time; (3) those in whom the vascular tone is very much below normal, and in whom under treatment it varies, but does not make any substantial gain. These cases do not improve much, and whatever is gained is of very doubtful permanency.

Dana⁵³_{Dec. 22} has made an interesting study of the urine in cases of neurasthenia, from which he draws the following deductions: (1) the importance of classifying neurasthenic types; (2) the existence of different conditions of the urine, corresponding to different forms of neurasthenia; (3) the existence of a functional inadequacy of the kidney in certain types of neurasthenia; (4) the greater frequency of heavy urines in irritative and diathetic forms of neurasthenia; (5) the existence of a polyuria in certain forms of neurasthenia; (6) the importance of recognizing these conditions by measuring and testing the daily amount of urine.

Clark³⁹_{July} and Walker³⁹_{Aug.} have interesting papers on neurasthenia and its treatment, and Ziemssen⁴⁰⁴_{No. 7} contributes a valuable article on treatment.

Traumatic Neurasthenia, or Traumatic Neurosis.—Probably the most interesting question in regard to neurasthenia that has been discussed during the past year is that of its connection with traumatism, especially that form of traumatism which consists in a

general concussion of the entire body, as in a railway accident. It is well known that in consequence of such accidents there may result, not only serious organic disease of the central nervous organs, but also a purely functional disturbance of these organs. This neurosis has, in the past, received various names—spinal concussion, railway spine, railway brain, hysteria, and now it is regarded as being more closely allied to neurasthenia than to hysteria. Oppenheim,⁴_{No. 9} as a result of his extensive clinical experience of cases of spinal concussion, states that the symptoms of the neurosis following such concussion are very manifold. The principal ones are mental depression and hallucinatory delirium, vertigo and spasms are frequent; there is a combination of hyperæsthesia and anaesthesia, not only of the cutaneous, but also of the special senses; tremor is common, movements are executed slowly and feebly, palpitation is frequent, and the general nutrition suffers. He considers the disease as depending on a cerebral basis; but it is seldom a pure neurosis, such as epilepsy, hysteria, or neurasthenia, and should be considered as a special traumatic neurosis, or traumatic neuropsychosis, of which the prognosis as regards life is good, but as regards perfect recovery is bad. In connection with Oppenheim's paper, Bernhardt,⁶⁹_{Mar. 20} reported two cases. One of these was in a railway collision. A week later he began to lose his memory, had attacks of fainting and dizziness, and his disposition became changed. From this condition he gradually recovered, resumed work, but his memory was poor, and he appeared changed. Eleven years after the accident he had an attack of unconsciousness, and symptoms altogether similar to those of general paresis of the insane gradually developed. The second case was that of a man who was kicked by a horse in the lower part of his chest and upper part of the abdomen, and who gradually developed, in addition to symptoms which pointed to an ulcer of the stomach, symptoms of a functional disturbance of the nervous system closely allied to hysteria. In discussing these cases Bernhardt insists that it is necessary to wait for some time after severe accidents before we can be sure that severe nervous symptoms will not supervene. The second case shows that neurotic symptoms may follow injuries not directly affecting the brain or spinal cord. He also considers that in addition to those cases in which, after traumatism, symptoms of an organic disease of the nervous system manifest themselves,

and those in which symptoms of a definite neurosis appear, there is a third class of cases in which a minute examination reveals no organic disease of the nervous system and no definite neurosis, such as hysteria, etc., and yet the patient suffers from pains in the back, from general weakness, from slow, awkward walk, from depression of spirits, etc.

Strümpell⁴⁷⁵_{11.3} has published a most valuable monograph, in which, in his usual lucid style, he makes a distinction between "general traumatic neuroses" and "local traumatic neuroses." The essential points in the conclusions which he draws are as follow:—

1. After severe general concussion of the central nervous system there frequently develops a complicated but characteristic set of nervous symptoms, for which the best name is general traumatic neurosis." This neurosis presents symptoms very similar to those of neurasthenia, hysteria, and certain psychoses (melancholia and hypochondriasis). Psychological factors are most prominent in its etiology, in which, however, the physical concussion is also a factor, and the relative importance of the psychological and physical factors varies in different cases. This general traumatic neurosis is incurable.

2. After locally acting injuries, especially, but not exclusively, after injuries of the extremities, severe nervous symptoms frequently develop (in great part in consequence of the psychological excitement associated with the injury) in the injured part. These nervous symptoms (local paralysis, contracture, anaesthesia, hyperaesthesia, etc.) are hysterical in their nature, every nervous disease being regarded as hysterical which depends upon a disturbance in the normal connection between the physical and psychological processes.

3. The distinction between the general and the local traumatic neuroses cannot be drawn very sharply. Transitions and combinations are not rare.

4. Combinations between true anatomical traumatic lesions and traumatic-neurotic symptoms occur and should be remembered in diagnosis, as the one may mask the other.

5. The general traumatic neuroses sometimes seem to prepare the soil for the development of organic diseases (general paresis, tumors).

Knapp²⁴²_{Oct.} read a valuable paper before the American Neurological Association, from which he draws the following conclusions:—

1. Concussion of the spine, in the strict sense of the term, although probable, is still a matter of doubt.

2. Muscular strain, spinal irritation, and peripheral neuritis are not uncommon complications.

3. Injury may give rise, not only to gross mechanical lesions of the central nervous system, with symptoms coming on soon after the accident, but also to typical chronic degenerative processes of insidious onset.

4. Injury may also give rise to various functional affections of the nervous system, including psychoses, hysteria, and neurasthenia.

5. Hemianæsthesia is not pathognomonic of hysteria, but is found in other conditions.

6. Psychological disturbances, anxiety, hypochondriasis, depression, emotional disturbance, and lack of power of application may exist alone or in conjunction with other affections.

7. The neurasthenic state is often produced by injury, but true hysteria is rare.

8. Both the hysterical and the neurasthenic states may be superimposed upon organic disease, obscuring the diagnosis.

9. There is a fairly typical symptom-complex, with psychical disturbance, paræsthesia, anæsthesia, slow and feeble movements, exaggerated reflexes, etc., which is not uncommon, and is probably due to organic disease.

10. The prognosis of these conditions is grave. Improvement is not uncommon, but complete recovery is rare.

Lyon¹⁸_{p.29} calls attention to those cases of traumatic hysteria which do not develop until long after the injury, and reports a case of his in which hysteria made its appearance for the first time nine months after an injury to the head. Sante de Sanctis⁵⁷³_{No.4} and Wolff¹¹_{Oct.4} each publish interesting articles on the traumatic neuroses.

GENERAL TREATMENT OF NERVOUS DISEASES.

In addition to the treatment mentioned in connection with each disease, there remains something to be said on the general treatment of nervous disorders. Mills¹_{Feb.4} publishes a valuable

paper on the treatment of nervous and mental disease by systematized active exercises, in which he goes over the ground very thoroughly, and insists on the value of these exercises in the insane. Gärtner²⁸³_{No. 49, '97} describes an apparatus for the therapeutic application of muscular work, which consists of a handle to be turned by the patient through a large circle, it being possible to increase or diminish the resistance offered by the handle. Bum.³⁸²_{Jan.} in a valuable monograph, discusses fully the value of direct massage in neuralgia, migraine, joint neuroses, anaesthesia, cramps, and paralyzes, and of indirect massage in cerebral and spinal diseases and in the neuroses. He describes how massage can best be given in each form of disease. Reibmayer⁸⁴_{Dec. 17, '97} recommends massage for the removal from the muscles of masses of exudation resulting either from contusions or ruptures of the muscles or from rheumatic inflammation; also in chronic myositis, contractures, and the various forms of cramps occurring in the professional neuroses. Graham⁶¹_{Jan. 7} speaks of the benefit obtained in neurasthenia from massage of the head and back, or of any other part that may be the seat of symptoms. Berne²¹_{Apr. 15} reports a case of brachial neuralgia in which a great variety of treatment had been tried without avail, but which was rapidly cured by massage, and Monnier²¹_{Nov. 25} reports two cases of muscular contractures associated with paresis which were cured by massage. Wide³⁷¹_{Ed. 19, H. 10} reports three cases, one of tremor, one of spasm, and one of paralysis, in which either a complete cure or great improvement resulted from pressure on the nerve-trunks, employed in either of the following ways: (1) repeated pressure of short duration; (2) massage of the nerves; (3) pressure continued for several minutes and associated with vibrations; (4) pressure continued for several hours.

He regards the action of nerve pressure as very similar to nerve stretching, though milder, and enumerates the parts of the body at which pressure can be applied to the nerve.

Howie¹⁷⁸_{Jan.} makes a favorable commentary on the Weir Mitchell treatment, without, however, presenting any new facts in regard to it. Playfair⁶_{Jan. 14} publishes a valuable paper on the limitations of this treatment, in which he states that, with few exceptions, cases of organic disease and insanity (other than hysteria) are not benefited by it, and urges that it be carried out thoroughly, if tried at all. Stieler³⁴_{Aug. 21} reports the results of the Weir Mitchell

cure in eighteen cases of neurasthenia in which many other forms of treatment had been unsuccessful. In nine of these it was perfectly successful, in one the result was very good, in two it was moderately good, and in six it was unsuccessful. He concludes that this form of treatment is a very valuable one and a great addition to our other methods, although not always successful.

MENTAL DISEASES.

By EDWARD N. BRUSH, M.D.,

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THE large amount of material at my disposal, while not indicative of much progress during the year, shows an active interest in the literature of psychiatric medicine. Much that has reference solely to asylum management, construction, etc., has been passed over without notice in these pages. The same may be said of reports of single cases, or unconfirmed observations and experiments.

An analysis of the literature of insanity for the year 1888 would be incomplete if it did not contain some reference to the addresses of Andrews (President of Section of Psychological Medicine and Nervous Diseases) and Tuke at the Ninth International Medical Congress. Though delivered in 1887, the publication of the transactions make these addresses part of the literature of 1888.

STATISTICAL AND GENERAL QUESTIONS.

Andrews, ⁴⁶²_{v.5, p.226} discusses the "*Distribution and Care of the Insane in the United States.*" The United States census of 1880, in a total population of fifty million one hundred and fifty-five thousand, gave an insane population of ninety-one thousand nine hundred and ninety-seven, or one to every five hundred and fifty-four of the inhabitants. Dividing the country into two belts, northern and southern, Dr. Andrews finds a very unequal distribution of the insane. In the northern belt the proportion of insane to population is the highest in the New England States, being one to every three hundred and fifty-nine. Passing westward, this proportion steadily decreases, falling in the newer States and in the Territories to one insane to every twelve hundred and sixty-three inhabitants. In the southern belt, the seaboard States show an insane population of one to every six hundred and ten inhabitants, while in the extreme Southern States this proportion falls to one to every nine hundred and thirty-five of the population, and still further decreases toward the West.

Separating the population (white) into native and foreign-born, the census, according to Dr. Andrews, shows in thirty-six million eight hundred and twenty-eight thousand six hundred and ninety-eight native whites, fifty-nine thousand five hundred and eighty-one insane, or one to every six hundred and eighteen, while the foreign-born, six million five hundred and seventy-four thousand three hundred and thirty, furnish twenty thousand two hundred and fifty-nine insane, or one to every two hundred and fifty. These figures, in my opinion, should furnish material for thoughtful consideration to those who are endeavoring to place some restrictions upon hitherto unrestricted immigration. The census of 1880 made returns of thirty-nine thousand and ninety-three insane in asylums and hospitals. Dr. Andrews has collected returns up to the close of the last report from these institutions previous to his address, showing an insane hospital and asylum population of sixty-one thousand four hundred and eleven. Of this increase, sixteen thousand four hundred and twenty-eight occurred in old institutions, and five thousand eight hundred and ninety in asylums (State) organized since the census of 1880. A proportionate increase would show an insane hospital and asylum population at the close of the year 1888 of about sixty-nine thousand in the States and Territories of the United States.

It may be interesting to know that at the termination of the period to which Dr. Andrews brings his statistics there were three hundred and seventy-seven medical men employed in the various hospitals and asylums from which the data are taken.

Dr. Andrews thinks that in the matter of asylum buildings there has been "in all directions, so far as relates to plans of construction and arrangements for the health and comfort of patients," marked progress in American institutions. In the matter of therapeutical care, while no marked advance has been made in some time, Dr. Andrews believes, evidently, that the asylum physicians have kept pace with other departments of medicine.

In the matter of moral as distinguished from therapeutic treatment, he says there has been a "great change of practice in the asylums of the country, which is seen in every direction in which the care or the interests of the patients are involved."

This change appears in the way of closer study of cases, greater attention to occupation and amusement, which include the

introduction of schools and systematic employment of patients. Another marked change in practice is the decided diminution of mechanical restraint, to the extent even of total abolition in some institutions. The removal of mechanical means of restraint necessarily involves on the part of the attendant or nurse greater care, closer observation, and more intelligent judgment. To secure these requisites, in several institutions training schools for attendants and nurses for the insane have been established, and in nearly all greater care seems to be exercised in securing desirable persons for these positions.

"The tendency," Dr. Andrews says, "in American institutions is toward greater freedom and liberty for the individual patient." This is brought about in some instances by open-door wards in some institutions, or by granting paroles, either general or restricted to the asylum grounds, to such patients as show sufficient self-control to inspire confidence in their ability to observe their parole.

Tuke reviews in a concise way the methods of providing for the insane and idiots in the United States and Great Britain. He takes occasion to comment favorably on the evidence of progress in the United States. He speaks of the provision in the State asylums of the United States for both pay and public patients as a salient feature, and queries whether some public patients are not crowded into almshouses by the presence in State asylums of pay patients. I doubt any serious danger in this direction, and am not at all certain that chronically insane paupers, who may be, and in many instances are, of foreign importation, and have never by labor or taxes aided to support these institutions, suffer any injustice by being kept in almshouses, while taxpayers who are not paupers, but who cannot afford to pay rates at private institutions, enjoy the care and treatment of the asylums for whose support they have been taxed.

In the matter of restraint, Tuke shows that the English asylum officers are not such rabid advocates of Conollyism as many would have us suppose, but advocate and exercise a wise discretion in the use of mechanical means of restraint.

Mechanical Restraint.—In regard to this vexed subject, Savage, of the Bethlem Royal Hospital for the Insane, London (Bedlam), made use of this wise maxim when discussing the papers

of Drs. Andrews and Tuke: "If you have your flag of non-restraint out, as a kind of banner of 'Excelsior,' I believe it will lead to good, but I hope that no one who is narrow-minded enough to say that it is impossible that restraint should ever be necessary will be listened to." Dr. Savage follows out this doctrine, and in so doing has brought down upon himself ^{Oct.6} the adverse criticism of one, at least, of England's medico-psychologists, who has attacked Dr. Savage in the *Times* newspaper for employing restraint. Dr. Savage very honestly says, ^{Oct.13} "I felt for a time restrained from doing what seemed likely to be useful to my patients because of this so-called principle of 'non-restraint,' but during the past two years I have gained confidence from experience, and I have tried the experiment with results which have justified my action." He declines to be bound by any principle except of humanity and humane treatment, "which, if it mean anything, means the use of every method likely to restore health."

Cottages for the Insane.—As an evidence of a gradual change in the form of structure deemed necessary for the care and custody of the insane, it may be mentioned that two of the annual reports of American Asylums for 1888 report the erection and occupation of detached cottages or villas for a certain class of patients. Others, to my knowledge, are already in use in connection with other institutions, while similar structures are contemplated. In the words of Dr. Chapin, ¹¹⁷⁸ these structures represent "a growing tendency to an evolution in the care of the insane toward a higher plane, which is now possible to a greater degree than at a former period. The cottage in connection with the Pennsylvania Hospital for the Insane is designed to furnish special accommodations to a class of patients who demand more spacious quarters and more elegant surroundings than are furnished by the already liberal provision made in the hospital wards.

At the Eastern Michigan Asylum, Pontiac, under Dr. Hurd, according to the statement of Dr. Burr, collaborator, two cottages, one for each sex, have been erected. Each is arranged to accommodate fifty patients of the working class. The cottages are each under the care of a man and his wife, who are experienced attendants, with a suitable staff of assistants, and each cottage has its own domestic arrangements, dining-room, kitchen, etc. The experiment, if it may now be called such, has been successful wherever tried,

and seems to offer a solution, or one solution, of the vexed problem, how to avoid "institutionalism" in hospitals for the insane.

Boarding Out of Pauper Lunatics.—D. Hack Tuke, corresponding editor, England, has favored us with a lengthy examination into the merits of the boarding-out system in connection with an account of a visit to a locality in Scotland where this system has been in operation for some time. We cannot do justice to Dr. Tuke's contribution in the short abstract which is here permitted, but must content ourselves with saying that the account of the system as he saw it in Fife, Scotland, presents in some respects a pleasing picture of home surroundings and domestic comforts for the chronic insane. But Dr. Tuke, who quotes freely from Sibbald and Fraser, of the Scotch Lunacy Board, in favor of the system, and who is attracted to it as one solution of the question of the best and most economical care of the chronic insane, points out some of its disadvantages.

He says: "Its success altogether depends upon the careful selection of cases and the equally careful selection of guardians, proper accommodation and locality, frequent and efficient inspection, and, lastly, the character of the household, in reference mainly to sex and age. As regards the cases suitable for boarding out, it would be a fatal mistake to suppose that all demented or idiots can be safely cared for in this manner. A very considerable number must always require asylum care and treatment. I have no doubt that the Scotch Commissioners are sufficiently alive to the necessity of bearing this in mind. Next, as to the guardians or care-takers, it seems to me perfectly certain that the qualifications necessary for occupying this position are not so common as to render it likely that the area over which an insane population can be scattered will be very extensive. So, again, as to proper and sufficient accommodation and suitable locality, it must often happen that these are not favorable to the carrying out of the system.

"That frequent and efficient inspection is necessary to prevent neglect or cruelty is obvious. I trust that in the case of Scotland the visits of the medical officer every quarter and the Commissioners, or Deputy Commissioners, to a large extent prevent the abuses likely to occur. It may also be hoped that the observations of neighbors may exert a wholesome check upon the actions of the guardians. It is admitted that lamentable results have

occasionally occurred in the families of the care-takers. Perhaps the wonder is that these have not been more frequent.

“ Lastly, but of almost primary importance, is the constitution of the household in which it is desired to place the patient. In many instances it will be highly unsuitable to allow children or young women to be in the house, although the patient might be very properly placed in the cottage of an elderly couple.

“ I consider it of the utmost importance that, while the interests of the insane are being regarded, we should not lose sight—as there is great danger of doing—of the interests, from a moral point of view, of the families into which it is desired to introduce a lunatic.”

Dr. Tuke is of the opinion that unless the above conditions are fulfilled the system will prove a failure.

Some editorial remarks in the *American Journal of Insanity* for October call attention to the impracticability of this system for American practice.

On the mere ground of expense alone it would be impossible to imitate the Scotch plan. I very much doubt whether families could be found who, at the rate of one dollar and seventy-five cents to two dollars per week, would submit to the annoyance and anxiety of caring for a chronic lunatic. As a feature of speculation, could active, able-bodied, willing laborers be always secured, it might be a paying venture to the care-takers, but it would simply be a return to the old farming-out system which so disgraced some of the States of the Union not many years ago. If the public authorities should see fit to offer a small compensation to poor families to care for their own quiet and harmless chronic insane under proper supervision and regulation, such boarding-out would, I believe, meet with approval.

TREATMENT OF THE INSANE.

Hypnotics.—The year has been somewhat prolific with articles upon hypnotics and measures for the production of sleep. T. M. Lloyd, of Brooklyn,^{80 Feb.} late of the Morris Plains, N. J., Asylum, publishes an article on “The Use of Hypnotics in the Insane,” giving not only his own experiences, but those of several asylum physicians to whom he addressed notes of inquiry as to their practice. The result of Dr. Lloyd’s inquiries indicates that chloral hydrate continues to be a favorite hypnotic, and that the bromides of sodium

or potassium, opium in some of its forms, hyoscine, hyoscyamine, some preparation of hyoscyamus, paraldehyde, and urethan are used in the order mentioned.

Hyoscine hydrobromate continues to excite attention. George Thompson, Superintendent of the Bristol Asylum,^{6 Feb. 4} reports his experience with it, concluding as follows: "We find, then, that in mania of any form the hydrobromate of hyoscine is the best calmative which has yet come to our notice. In some cases of general paralysis attended by busy restlessness, with dry skin and some suppression of urine, a small dose puts the patient in a much more comfortable state." Dr. Thompson uses as his ordinary dose $\frac{1}{200}$ of a grain (0.000324 gramme).

Eugene Konrad,^{68 Nov. 12} reports upon *hyoscine hydrochlorate* and draws the following conclusions: 1. He regards the drug of value in violent states of excitement, especially with great restlessness, in doses of from one-half to one milligramme ($\frac{1}{1000}$ to $\frac{1}{1000}$ grain) hypodermically. This treatment is not kept up for more than two or three days at a time, on account of bad symptoms, disturbances of cardiac innervation, hallucinations, dryness of throat, etc. 2. In acute curable psychoses he avoids the use of the drug as long as other less-perturbing methods give satisfactory results. If, however, exhaustion from too great activity is impending, the hyoscine should be employed. 3. He cautions physicians against its use in all cases complicated by cardiac diseases.

Adam, of Paris,^{57 Oct. 20} after using *urethan* some four hundred times upon thirty cases (eighteen women, twelve men), feels justified in stating that it is a valuable hypnotic, not only in functional disturbances, but in organic diseases of the brain. He used doses varying from fifteen to seventy-five grains (1 to 4.86 grammes), and in those patients of sufficient intelligence to report upon their sensations no unpleasant results were observed.

J. P. Crozer Griffith and Elwood R. Kirby,^{9 May 19} publish some notes upon urethan and amyl hydrate in insomnia. In none of the cases, nineteen in all, upon whom urethan was tried, was insanity a complication, though in a few central nervous lesions were present. In reference to urethan, they conclude that as an hypnotic it is "uncertain and unreliable." In the eighteen cases to whom *amyl hydrate* was given very favorable results were obtained,

Of this series, one had acute mania, one dementia, one was a case of alcoholic delirium, and one of the opium habit. In the last case slight delirium was produced by forty minims (2.46 grammes), which in two or three hours gave place to quiet sleep. In respect to amyl hydrate, they conclude that it is more powerful than urethan or paraldehyde and to be preferred to them or chloral. They have administered it in capsules.

Boubila and Hadjes,¹⁸_{May, June} make a report upon the therapeutic effects of *methylal* as an hypnotic with the following conclusions, drawn from thirty-three cases:—

1. *Methylal* is a hypnotic which may be employed advantageously in place of the usual sleep-producing drugs in simple manias, acute mania excepted; in *folie à double forme* during the period of depression, in intermittent mania (paroxysmal), in epileptic mania, and in dementia consecutive upon organic lesions of the brain. In general paralysis its action is somewhat doubtful. 2. Its solubility, ease of administration, agreeable taste, and entire safety are all in its favor as compared with the majority of other hypnotics.

The hypnotic of the year, and one which bids fair to maintain its popularity longer than many of its predecessors, is *sulphonal*, or, as it is also written, *sulfonal*. The name is derived from one of the syllables which are combined in its chemical name—diethylsulphondimethylmethan. Its symbol is $(\text{CH}_3)_2\text{C}(\text{C}_2\text{H}_5\text{SO}_2)_2$.

This substance was discovered and its composition described by Bauman,¹¹⁷⁹_{v. 19, p. 207} who, in conjunction with Kast, made a series of tests of its physiological action upon animals and subsequently upon human beings.

Aug. Cramer, of Freiburg,³⁴_{June 12} recorded his experience with this hypnotic in the treatment of insanity. He employed it in twenty-five cases under his own observation, using it one hundred and ninety-two times, and is able to report upon its use by Professor Cramer in twenty-four additional cases, where it was employed two hundred and fifteen times, making in all four hundred and seven prescriptions to forty-nine patients. Of these cases twenty-five had melancholia, nine hysterical disturbances, eight mania, four paresis, two paramora, and one hebephrenia.

Positive results were obtained three hundred and seventy-seven times (92.6 per cent.), a sleep of five or more hours being obtained.

On thirty occasions the drug was not productive of any result. In all instances control experiments were made, and the patients were kept under careful observation.

In one case of melancholia the depression was removed as long as the patient was under the influence of the drug. No bad effects were observed from its long-continued use.

Ruscheweyh, of Jena, ⁷⁵_{Nov. 1} also speaks favorably of his experiences with sulphonal. He employed it upon twenty-four cases, administering it two hundred and twelve times. On 11 per cent. of the occasions no response was met. He found that the best results were obtained when it was given in hot bouillon or milk, but that a bitter taste was imparted to these vehicles. In several instances its administration was only necessary every other night, but in excited cases its nightly use was necessary. In one case of the morphia habit sulphonal gave quiet, refreshing sleep after the removal of the narcotic. Of the sequelæ, drowsiness during the day following its administration, emesis on awakening, loss of appetite, which, however, returned after withdrawing the drug, and diarrhœa are mentioned. No effects upon the condition of mental disturbance present were observed. I doubt the accuracy of observations made upon the effects of sulphonal administered in hot milk or bouillon; as, as has been pointed out elsewhere, these agents alone are sometimes all that is necessary to produce quiet sleep.

R. Otto, of Dalldorf, ²⁰⁵_{Bl. 45, H. 4} contributes a detailed report of the effects of sulphonal upon nineteen female patients. From his experiments he concludes that sulphonal is an effective hypnotic for insane patients in doses of about thirty grains (two grammes), with only exceptional unpleasant symptoms resulting. It is, he thinks, a valuable sedative in prolonged mental excitement. For this purpose he recommends doses of seven or eight grains (0.5 gramme) repeated four or five times a day for several days. The only unpleasant effects observed was vertigo in a few cases.

Algeri ⁵⁸⁹_{Oct. 8} has used sulphonal in producing sleep in insane criminals. The cases that came under his observation embraced all the ordinary forms of mental disturbance, and the author was successful in its employment in the majority of instances. The doses ranged from fifteen grains (one gramme) to one drachm (3.9 grammes). After the larger doses some drowsiness was observed the day following.

Wetherill¹⁹_{Oct. 18} makes a report of the employment of sulphonal upon eight insomniac patients in the department for women of the Pennsylvania Hospital for the Insane. All of these cases were refractory to other hypnotics except hyoscine hydrobromate. The drug was administered two hundred and thirty times to these eight individuals. In one hundred and ninety-six instances from five and a half to nine hours of continuous sleep followed. In fifteen instances four to five hours' sleep was had, but two to three and a half hours ensued in nine instances, and in ten instances no sleep was obtained. No unpleasant results were observed.

I have used this hypnotic for over six months in the treatment of insane and other patients. It has been administered in doses ranging from ten to thirty grains (0.65 to 2 grammes). The cases were acute and chronic insanity, alcoholism, the opium habit, and insomnia, with hypochondria and hysteria. All the cases were males. In a few instances drowsiness was complained of on the following day, but this disappeared on reducing the dose. In two cases diarrhoea occurred, which ceased on discontinuing the drug in one instance, but in the other was apparently simply the return of an old chronic affection. In cases of alcoholism and the opium habit it has acted very satisfactorily, but not more so than hyoscine hydrobromate.

Fischer, of Buda-Pesth (quoted by Schuschny¹¹⁶_{Nov.}), reports upon some observations with *antifebrin* among the insane. He found it of especial value in doses of from seven to twenty grains (0.45 to 1.3 grammes) in neuralgias and in certain cases of cephalalgia. As an hypnotic its action was uncertain, producing favorable results in some cases, failing wholly in others. In one case where chloral and the bromides had no effect and morphia was contra-indicated by reason of idiosyncrasy, antifebrin produced sleep.

Treatment of Insomnia without Drugs.—All physicians who have much to do with cases of insomnia (and in dealing with insanity insomnia becomes often one of the most troublesome features of the case) are met by the problem how best to combat persistent sleeplessness. A. Symons Eccles¹⁵_{Mar.} presents a very interesting and suggestive contribution to the therapeutics of this condition. He finds, in common with others, sleeplessness, or unrefreshing sleep, associated in many instances with gouty or

dyspeptic states. In many of these cases he finds that a hot bath, properly administered, is productive of a restful sleep, though in some instances of but four to five hours in duration. The author does not think that the administration of a hot bath is such a simple matter as it might seem, and gives detailed directions. The temperature of the room in which it is administered should not be less than 65° F. (18.5° C.). The patient, when nude, should stand with his head over the edge of the tub, and the head and face be rapidly douched with water at 100° F. (37.8° C.). The cooling of the body from exposure to the air and the determination of blood to the head from the hot sponging cause a dilatation of the vessels of the entire brain. The entire body is then immersed, excepting, of course, the head, in a bath at 98° F. (36.7° C.), which is rapidly raised to 105° to 110° F. (40.6° to 43.3° C.), according to the condition of the patient. At the expiration of from eight to fifteen minutes the patient is taken from the bath, wrapped in warm blankets, and slowly, without exertion, conducted to his bed-room. The warm blankets absorb the moisture, the patient's night-clothes are donned, a warm bottle placed at his feet, and the room darkened. In a few minutes sleep supervenes.

The theory on which these proceedings are based is that the suddenly unclothed body in a temperature of 65° F. (18.5° C.), suffers a contracture of a large vascular area, with corresponding dilatation of the vessels of internal organs, further induced in the brain by the hot douching of the head. In this way a thorough filling of the vessels of the brain is produced. By the immersion of the body the vessels of the trunk and extremities are dilated, contraction of the arterioles of the brain occurs, which, with the gradual slowing of the heart's beat resulting from the warm bath, "reduces the supply of blood to the whole of the brain," decreasing its functional activity throughout, and inducing complete functional rest.

Dr. Eccles refers to the benefits of massage in certain insomnious patients, especially those for whom, on account of heart or vascular disease or great exhaustion, the above methods would be unsafe. In certain cases of extreme cutaneous hyperæsthesia the massage and kneading must be supplanted by gentle friction of the back or limbs, with brief kneading of the abdomen, to which, after the manipulation, an abdominal compress is applied, followed

by chafing of the feet with firm upward friction, until the local temperature reaches 97° F. (36° C.). Eccles describes his abdominal compress with as great care and minuteness as he does his method of administering a warm bath. "It consists," he says, "of a piece of twilled calico, half a yard in width and eight yards long, divided into two lengths of four yards each. These bandages are lightly rolled up, and sometime before they are needed are placed in a closed earthenware vessel in a hot oven, where they are raised to a great heat. As soon as they are required they are brought in the covered dish or jar to the bedside. One is then unrolled for as much of its length as is necessary to cover the abdomen; this portion is immersed in water and applied closely to the abdominal wall, the unwetted portion being wound rapidly and firmly over it and round the abdomen and loins of the patient; the remaining four yards of the heated bandage, which has been left in the closed vessel, is then taken out and passed round the body of the patient over the first portion already applied, so that from the lower part of the chest to the hips the trunk is swathed in hot bandages, the first layer of which is saturated with moisture. In this way heat and moisture are applied to the abdominal walls, keeping up the free circulation of blood already established in the dilated vessels, promoting a sense of warmth and comfort, and certainly exercising a soothing influence on the nervous system, which most usually culminates in peaceful sleep."

In many cases of prolonged overwork, mental distress, opium, or other narcotic habit, after other measures have failed, the wet-pack has been found by Dr. Eccles to serve admirably. He makes the precautionary remark that with these cases a subnormal surface temperature is found in certain instances, and that whenever the temperature of the foot is under 90° F. (32.2° C.), and that of the palmar skin below 95° F. (35° C.), the surface temperature must be raised by friction of the limbs and trunk, with as little exposure of the body as possible.

I have for some years practiced in a modified form some of the methods above enumerated, and can speak with confidence of their value. I have found that hot sponging to the spine, the administration of hot milk, beef-tea, etc., and in some instances hot baths with moderate cold to the head have exercised a pleasing and lasting calmative influence upon the nervous and insomniac.

E. Fletcher Ingals, collaborator, suggests that certain cases of insomnia awakening after an hour or two of sleep may again produce sleep by a species of autohypnotism, by casting the eyes down under the closed lids and keeping them resolutely fixed there. In a short time sleep results. In cases troubled by business and other thoughts he suggests a memorandum of the ideas made in the dark, that they may thus be dismissed and the patient apply himself to sleep.

HYPNOTISM.

Hypnotism continues to excite, especially in France, marked attention, and the reports of cases which have appeared in the French, German, and Belgian journals approach the marvelous and, in more than one instance, test the credulity of the reader.

There appear to be two schools of hypnotism, viz.: That of La Salpêtrière, under the direction of Charcot, and the school of Nancy, of which Bernheim is the most prominent figure. The results from La Salpêtrière are coming somewhat into disfavor by reason of the fact that so many of the subjects are hysterical, and also from the fact that they have become, as it were, trained cases.

Bernheim and his followers claim, furthermore, that the method of Charcot is not the correct one, but that the so-called method of "suggestion" is the one which should be pursued.

One of the most exhaustive articles which has appeared in the periodical literature of the year is a "Critical Essay on Modern Hypnotism," by Seeligmüller, of Halle.⁶⁹ Jan. 8 The careful and judicial examination which this writer gives to the subject is indeed refreshing after one has gone through the great mass of material, some of it of the most absurd and chimerical sort, which has accumulated upon this topic. Starting out with the action at a distance of toxic and other agents, he examines the statements of Bourru and Burot and the claims of Luys. Space will not permit us here to enter fully upon this subject, nor does it, as far as experience teaches, have much bearing upon insanity or its treatment. Seeligmüller does not agree with the authors above named, in this concurring with the Committee of the Paris Academy of Medicine, who carefully examined the statements of Luys and repeated his experiments with negative or contradictory results

(see report of MM. Hérard, Bergeron, Brouardel, Gariel, and Dujardin-Beaumetz¹⁶¹_{Mar 18}).

After examining the phenomena of "suggestion," reviewing briefly the writings of Richet, Charcot, Bernheim, Liébeault, Brémand, Liégeois, and others, he withholds a final judgment upon what, notwithstanding the great amount of contradictory writing, seems to present a field for real work and investigation. He is in accord with Armand Hucel, that more is to be expected from psychological than physiological investigation in this line. In respect to this last statement a review²⁶³_{May} says: "Physicians cannot study these phenomena with safety to their scientific reputation without more training in modern psychology than even the best medical schools in France or in our own country now afford." The physiological side of the question has, however, its interesting features, and those who are seeking information will find it in an excellent lecture by Theo. Meynert.⁸_{Aug. 30, Sept. 6}

Passing from the general phenomena of suggestion to its therapeutical application, Seeligmüller reviews what has been reported upon this branch of the subject. We have only room here to allude to the application of hypnotic suggestion in the treatment of insanity. It has been tried in melancholia, in various forms of delusional mania, etc. In the latter it has been proposed that by suggesting a line of ideas the opposite of the delusions entertained some valuable results might be obtained. Forel, who has had more experience than any one in this direct line, says "the field of psychoses is extremely unfavorable for the therapeutical effects of suggestion."

Aug. Voison²¹¹_{May} has reported the results of treatment by suggestion of two cases of insanity of persecution. In one case recovery took place and in the other a considerable amelioration of the symptoms occurred. Voison also reports²⁴¹_{Nov.} the cure of a case of moral perversity in a youth of sixteen. This young man had been from his seventh year almost incorrigible and was growing yearly more vicious. Various schools and correctional institutions had been tried in vain. Hypnotic suggestion was employed by Voison, who was able in a few weeks to work a complete change in the young man's character, and to report at the end of nearly four months that the change had continued.

To return to Seeligmüller's essay. Following the therapeu-

tical application, he next considers its applicability as a means of intellectual and moral orthopædia. This application of Braidism was suggested as long ago as 1860 by Durand (de Gros), who asserted that it would one day be successfully employed in schools and correctional institutions. The legal relations of hypnotism and the medico-legal relations involved cannot be discussed here. I would agree with Forel that little is to be expected from hypnotism in the therapeutics of insanity. Its application, in the first place, is attended with difficulties not met with elsewhere, and it is to be doubted whether Bernheim and his followers, when they claim to be able to hypnotize 80 to 90 per cent. of all cases, included the insane among the hypnotizable, at least to anything approaching that proportion. Secondly, an element of danger arises in attempting to hypnotize delusional cases lest the very act give rise, despite all attempts at suggestion, to a new train of delusional ideas.

In cases of inebriety and habit cases in general, if the reports of Forel may be accepted as a guide, some good may be anticipated, but too much stress may have been laid upon "cures" in which time had not been had for a relapse.

From a brochure upon hypnotism by Schrenck-Notzing¹¹⁸⁰ the following conclusions are taken as exhibiting in brief the opinions held by the practitioners of hypnotism as a therapeutical agent: (1) suggestion is the foundation of psycho-therapeutics (hypnotic?); (2) different nationalities do not materially differ as to hypnotizability; (3) the dangers reside in the method, which must vary with the individual; (4) when other measures have failed hypnotic suggestion should always be tried; (5) the principal application of hypnotic suggestion is in functional troubles of the nervous system.

It has been thus far impossible to give a definition of hypnotism which satisfactorily meets all the phenomena observed. Perhaps the one presented by the Committee of the Académie Royale de Médecine de Belgique⁵² is as good as any, and yet the reader will observe in it certain arbitrary expressions which convey no intelligent impression of the exact condition to which they are applied. The Commission say: "Hypnotism consists in a dynamic modification of the nervous system, particularly the brain, ordinarily provoked by external impressions or special manœuvres.

It is a sort of experimental neurosis, *névrose expérimentale* (Charcot) in which the will is extinguished or in abeyance, consciousness is diminished and abolished, the senses are exalted or depressed, and muscular action is perverted. It is a condition "secondary" (*condition seconde*), in which the personality is transformed and becomes docile under the direction of the person who provokes the hypnotic state. It is a sort of induced sleep (nervous sleep, artificial somnambulism), in which the subject becomes an automaton, without reason, will, or memory. It is a species of disassociation of the diverse faculties, a rupture of the normal equilibrium, characterized by a weakness of the higher faculties of the brain which permit the lower or automatic to predominate." The foregoing partakes really more of the nature of description than definition.

Forcible Feeding of the Insane.—Julius Rader, second physician to the asylum at Ybbs, ¹¹³_{Feb. 5} publishes an account of a case from which he seems to draw the conclusion that forcible feeding, like the mechanical restraint of the past, has been overdone and abused. Rader's paper, if it has accomplished no other good, furnished food for discussion at a meeting of the Philadelphia Neurological Society, March 20th. The discussion was opened by Jno. B. Chapin, who took the ground that the danger lay rather in too long delay than in the unnecessary application of means to administer food against the wishes of a patient. He pointed out that 80 per cent. of cases admitted to hospitals for the insane presented visible evidences of impaired nutrition, poor food, and little of it; and that one of the marked changes in hospital practice, based on ample experience and good results, had been the liberal administration of food as one of the most effectual means of restoration. None of those who followed Chapin, including Hall, of the Friends' Asylum, Charles K. Mills, William Osler, and others, were inclined to look upon the operation as performed by expert hands as either forcible in the sense of being harsh, or attended with the dangers which Rader seemed to fear. Osler spoke of having, in the post-mortem room, observed in the course of several years three or four cases of deglutition pneumonia (*schluck-pneumonie*). In a large experience, in feeding, I have never seen such a case. As I remarked in the course of the discussion above referred to, no force should be used beyond gravity in passing food into the stomach.

The old stomach-pump is worse than useless. An ordinary Davidson syringe attached to a No. 12 soft-rubber catheter supplies all the apparatus necessary. The bulb should not be compressed until the tube is certainly in the œsophagus or stomach, and after the first compression position of the vessel holding the food and siphon action may be trusted to fill the stomach. Danger of food entering the larynx or trachea may be obviated by pinching the catheter tightly on withdrawal. These views are borne out by a paper by Descourtis.¹⁸_{Oct.} This author prefers the method of feeding by nasal catheter, and maintains that if proper precautions are employed no danger is to be apprehended.

COMPLICATIONS.

Insanity in Relation to Heart-Disease and Phthisis.—Mickle, in the Gulstonian lectures for 1888, ⁶_{May 12} took the relation of cardiac and aortic disease and of phthisis to insanity for his subject. After discussing briefly the phenomena of the cerebral circulation and referring to our want of knowledge upon the question of action and reaction as related to insanity and cardiac disease, as to how much the insanity modified the heart affection, for example, the lecturer took up the influence of cardiac disease on mental states and the production of mental symptoms. He made the following propositions, some, at least, of which are not demonstrated facts, and must be received subject to further study and inquiry:—

1. Heart-disease may act by disturbing the balance of general circulation.
2. It may act by disturbing the intracranial circulation; this includes its effect on the local vasomotor mechanism.
3. It may operate by leading to a change in the composition of the blood within the cranium.
4. In a similar way it may affect the blood generally.
5. It may act by the pulmonary disorder it induces and the morbid impressions and sensations resulting therefrom.
6. It may become, through the nerves, a source of peripheral irritation, and influence cerebral functions reflexly by sympathy, inhibiting some forms of activity, deranging others.

We cannot follow the lecturer in the minute detail of clinical observation with which he reinforces his statements. No mere abstract would do the lecturer or the subject justice.

Of phthisical affections and insanity he has not so much to say, but the ground from a clinical stand-point is well covered. He

shows that insanity may, and in many cases does, supervene upon phthisis in the relation of effect and cause, and makes a classification of cases which may be said to be of phthisical origin.

Insanity may also be coincident with phthisis, which it modifies or by which it may be modified, and in another series of cases insanity may precede phthisis, and in some instances, by the habits of the patient, the enforced environment, etc., produce or hasten the evolution of lung disease.

Such studies as those of Dr. Mickle add to our knowledge of medicine and of the interdependence of morbid physical and psychical states, and, in connection with the record of his observations, reference should be made to the article by Spitzka¹⁹ upon "*Abdominal Disease and Insanity*." The author enters upon an interesting discussion of the relations between visceral and mental diseases, and cites some valuable references in support of the general proposition that such relation exists. Dr. Spitzka is not inclined to think that visceral disease in persons of good heredity, as concerns mental or nervous disease, exerts much, if any, influence in producing insanity. In cases of an unstable nervous organization, an attack of dyspepsia, rectal prolapse, abscess of the liver, etc., may be the exciting cause of mental disturbance.

He points out one difference, which others have noticed, between ordinary melancholia and the depression arising from disease of the gastro-intestinal canal, viz.: that in the latter the depression is less profound and the patient is more inclined to seek relief by treatment than in typical melancholia.

RECOVERY FROM CHRONIC INSANITY.

It has become a well-established fact that insanity of long duration is, in the majority of instances, hopeless. Indeed, if anything may be gathered from statistical inquiry, insanity of over one year's duration is well-nigh hopeless, so small is the percentage of recoveries. It is well, however, to bear in mind that even cases of many years' duration sometimes recover, and, with a desire to impress this fact, reference is made to a few cases of recovery which have been reported during the year.

Gucci³⁷⁶ gives the statistics of the admissions and discharges at the Asylum for the Insane in Florence from 1850 to 1887. Eight

thousand and forty-eight males and six thousand five hundred and eighty-nine females were admitted, of whom two thousand six hundred and thirty males and two thousand four hundred and fifteen females were discharged recovered. Of these seventy-two males and ninety-seven females had remained in the asylum over two years, as follows: Fifty-three, three years; forty-five, four years; twenty-six, five years; eighteen, six years; thirteen, seven years; three, eight years; one, nine years; two, ten years. Eight, five men and three women, had been under care more than ten years, the men eleven, thirteen, fifteen, twenty, and thirty-two years, and the women thirteen, sixteen, and twenty-three years. The author comes to the conclusion from his inquiry that in cases in which there is no progressive mental weakness the outlook, even after a long period, is not wholly hopeless.

Articles upon this subject have appeared during the year by Strahan¹⁶⁶_{July} and by Campbell²⁷⁸_{July}. The lesson to be learned from these cases is, as we have pointed out, that even chronic cases may recover, and that pessimistic views of such cases are unsafe and unwise.

GENERAL PARESIS.

It is probably within the bounds of truth to say that no one form of mental disturbance receives as much attention as does general paresis (general paralysis of the insane, paresis, parietic dementia, dementia paralytica), and yet none is attended with such distressing complications or has such uniformly fatal result.

The literature of the year has not added materially to our knowledge of causation or pathology, and absolutely nothing encouraging in the way of treatment has been put forth.

The Ninth International Congress of Medicine, in its Section of Psychology,⁴⁶²_{v.5} devoted a considerable portion of its time to a discussion, opened by Savage, Superintendent of the Bethlem Royal Hospital for the Insane, London, on syphilis as related to general paresis. The concurrence of opinion was that syphilis was a factor of no mean importance in the production of general paresis, but that little or nothing was to be expected from antisyphilitic treatment. These views are similar to those expressed by Régis,⁵⁵_{June 39} who thinks that there are rare cases in which all the symptoms of general paralysis appear in syphilitics, which symptoms rapidly disappear under antisyphilitic treatment.

Three articles have appeared during the year upon general paresis from traumatism. The first, by E. A. Christian, of the Eastern Michigan Asylum, Pontiac,²⁷⁸_{Apr.} is a report of a case with the symptoms of general paresis following fracture of the occipital bone, extending into the foramen magnum. Both fossæ were also involved. Ball,¹⁸_{July, Aug.} and Arnaud,¹⁸_{Nov., Dec.} report a case of paresis resulting from injury to the head in a railway collision. These cases are of interest as bearing upon one of the accidental etiological factors of the disease, but it may at the same time be questioned whether all of the elements of true general paralysis of the insane was present in the clinical picture drawn.

Low Temperature in Paresis.—M. Schönfeldt,²¹_{Nov. 31} reports two cases of subnormal temperature in the insane. Both cases were paretics. In one the temperature fell to 29.5° C. (85.1° F.), but owing to a pneumonia it rose to 37.2° C. (99° F.) just before death.

Reading of Paretics.—Kraemer,¹³_{Sept. 15} has made a series of examinations as to the ability for coherent reading in paretics. He found that the ability to read was markedly disturbed in this form of disease, to such an extent, indeed, that he considers the incoherent reading as one of its pathognomonic signs. I have repeated Kraemer's experiments in a few cases, and in all found a deviation more or less wide from the printed text when an attempt at reading was made. In some instances this seemed to be the result of an inability to pass from the termination of one line to the commencement of the next. In others irrelevant matter was introduced, and in others a confused jumble of the words on the printed page was rendered.

Paresis in Women.—Siemerling,⁷³_{July 14} reports that the proportion of women to men admitted in *La Charité*, 1880–1886, suffering from paresis was one to three. The disease was most common between the ages of thirty-six and forty years. Special attention was directed to fixity of the pupil, which was observed in 64 per cent. of the cases, and to the knee reflex, which was augmented in 34 per cent. of the cases.

C. B. Burr, collaborator, reports that at the Eastern Michigan Asylum twenty-one paretics have been admitted in ten years among the women received. Twelve of these cases have been received during the past twenty-one months.

Perforating Ulcer and Paresis.—Montyel¹⁸_{May, June} asserts that anæsthetic ulceration of the plantar aspect of the foot is much more common in paretics than has been supposed. He explains this upon the theory that the condition is one which must be carefully looked for to be recognized, and that in the past attention has not been sufficiently directed to the state of the feet. He maintains that the condition is chiefly found in those cases of paresis due to alcoholism, and that its presence is indicative, as far as the present observations point, of remission in the course of the disease.

Central Tumor Simulating General Paresis.—D. Hack Tuke, corresponding editor, refers to two cases which have recently occurred in Bethlem Hospital, London, showing the difficulty which sometimes exists in making a diagnosis between tumor or other grave brain diseases and general paresis. These cases are fully reported by Savage.¹⁶⁶_{July}

Traumatic Insanity.—Under this title Clevenger⁹⁸_{July} devotes considerable space to an interesting and valuable study of a too much neglected subject. His conclusions are as follow:—

“Traumatism may precede insanity and have no relation to the insanity, just as head injury is compatible with sanity.

“Traumatism may predispose to traumatic or other forms of insanity, especially alcoholic and syphilitic.

“Traumatism may be the exciting cause of traumatic or other forms of insanity in the predisposed, as hebephrenia and paranoia.

“Traumatism may modify, complicate, or aggravate other forms without the clinical symptoms of traumatic insanity appearing. The latter may co-exist with other forms of insanity.

“Traumatism may act both as predisposing and exciting cause, producing traumatic insanity by itself (Dickson, Luys, and Schläger), but hereditary or other taint causes greater liability.”

It will be observed that Dr. Clevenger speaks of traumatic insanity as a distinct type or entity. I cannot agree with the author in setting this up as a distinct and peculiar psychosis. Dr. Clevenger's article is very rich in references to the writings of others, some of whom support his position, but I feel that neither on theoretical nor practical grounds is such a division admissible.

Hallucinations in Connection with the Function of Speech.—Séglas⁷³_{Aug. 25} concludes an article on this topic as follows: 1. In addition to the usual and common auditory and visual hallucinations

there exist hallucinations of language, visual, verbal, and auditory, which are psycho-sensorial when regarded with reference to the centres of sight and hearing. 2. The motor centres of speech may be the location of similar phenomena. 3. Psychological hallucinations frequently include a motor element. These may be divided into three groups, one purely word motor, others including a sensorial element, and, lastly, comprising a peculiar state of mind not amounting to absolute hallucination."

PARANŒA.

This word seems to have made for itself such a place in the nomenclature of psychiatry that it may now be accepted as one of the terms which are recognized by the profession. Unfortunately, much confusion has resulted from the misapprehension which always exists as to the strict application of new terms, and many cases have been described under the name paranœa which do not properly belong there. Hurd,²⁷⁸ at the meeting of American Asylum Superintendents in May, called attention to these improperly reported cases, and urged the importance of carefully observing the boundaries of this form of disease and not endeavoring to make the term cover too much. In my opinion, if it can be well established and by some general concurrence agreed as to what is meant by paranœa, the term may be as good as any other. It is brief and not liable to be confused with anything else. The danger, however, is that what one may call paranœa another may not receive as belonging under that head. Another and striking objection to the term is that it conveys no meaning which is alone applicable to the class of cases for which it is used.

Ségla's,²⁴² in an interesting and valuable article, which has been translated by Noyes,²⁴² enters upon an historical and critical review of paranœa. He traces the origin of the terms *primäre, verrück, theit*, and *wahnwitz* of the Germans, monomania and delusional insanity of the English, *folie héréditaire, délire ambitieux, délire chronique, délire de persécution*, etc., of the French, and shows the common characteristics of the phases of mental disturbance described under these terms, and that they may all be grouped under the term paranœa. It is impossible to condense within the limits of this article such a description of these cases as shall make them comprehensible to those not thoroughly familiar with the

literature of insanity. Indeed, there is still so much disagreement among authorities as to the finer shades of difference, as to whether there is a primary and a secondary paranoïa, or whether or not there may be curable forms, that I cannot here attempt a definition or a full description. For the benefit of those who have not access to the current and recent literature of psychiatry, it may be said that cases of paranoïa belong to the degenerative forms of insanity. They have an inherent mental defect which may or may not show itself in any marked way until some obvious form of insanity becomes manifest. This usually takes the form of fixed delusions, frequently of persecution, with ideas of grandeur and importance. These cases frequently present little mental disturbance in other directions; memory and judgment as to ordinary matters disconnected with their delusions are fair (hence the term monomania). They are usually intensely conceited, quarrelsome, restive under restraint, suspicious, and liable to outbreaks of violence. It has been said, with considerable exaggeration, that a paranoïac will attempt homicide if he lives long enough. The termination of the condition is in dementia. The prognosis is always unfavorable.

Chronic Delirium.—The *Société Médico-Psychologique*, of Paris, in October, 1886, instituted a discussion upon chronic delirium which has continued with marked interest until recently. Rouillard¹⁸_{Sept., Oct.} reviews the discussion, a report of which runs through several numbers of the *Archives de Neurologie*, *l'Encéphale*, *Annales Médico-Psychologiques*, and other French medical periodicals. To those who lack the time or inclination to follow the discussion closely, Rouillard's article will afford an excellent epitome thereof.

The term *chronic delirium* was suggested by Lasègue in 1852, and some of his enthusiastic admirers propose to further confuse and complicate the nomenclature of insanity by classing these cases under the term Lasègue's disease. Magnan, however, has more thoroughly gone into the matter. We do not propose here to give his very full and somewhat abstruse definition, but take the shorter and more concise one of Paul Garnier, his pupil: "Chronic delirium is a mental disease with a tendency to become chronic by progressive evolution. This evolution is by four stages, always in the same order: 1. The period of incubation characterized by depression, restlessness, and a condition of psycho-sensorial erethism.

2. A period of delirium of persecution. 3. A period of exalted ideas, delusions of grandeur. 4. Terminal and irremediable dementia." The order and constancy of these stages was disputed by many of the participants in the discussion; but, notwithstanding the spirited assault of Séglas³⁶¹_{Mar., May} and others upon chronic delirium as a distinct psychosis, it seems to be accepted by the members of the Society, unless they shall decide upon further debate to adopt the term *paranœa* in its place, which might be easily done by a slight readjustment in classification. Reference to the term *paranœa* would be incomplete without mention of the very interesting account of a case published by William Noyes,²⁶³_{May} which, however, does not permit of satisfactory analysis.

FOLIE À DEUX.

Several articles have appeared during the year upon *folie à deux*. D. Hack Tuke¹⁷_{Jan.} contributes a lengthy article upon this interesting phase of mental disturbance. He includes under this term not only (1) cases in which one person infects another with the same mental disorder, in the sense that fear or good or bad example are said to be infectious, but (2) cases in which shock or painful impressions in witnessing an attack of insanity, or strain of nursing, produces in a second person an attack of insanity; (3) cases in which two or more persons become insane simultaneously from the same cause; (4) cases in which one lunatic infects another lunatic with his delusions; (5) twins. Examples of these various classes are given by the author. His conclusions are: That the influence of the insane upon the sane is exceptional. As an almost universal rule, those who are so affected are neurotic or somewhat feeble-minded. More women become affected than men. It is not the outrageously insane who influence others, but those who still possess considerable mental activity, with some method in their madness. The most common form of communicated insanity is that of delusion, especially of persecution, of being entitled to property, etc. Cases of acute mania, melancholia, or dementia, if they excite any prejudicial effect, do so by the distress which they occasion in the minds of others. Young persons are more liable to adopt the delusions of older persons than *vice versa*, especially if the latter be a relative.

Tuke shows that our comprehension of this affection is sim-

plified by a comprehension of the influence which one sane person exercises upon another. From this it is not a long road to the acceptance of a plausible delusion. He refers to the influence which the person affected exerts upon the primary agent in some instances. In conclusion, he points out that the matter has a practical as well as a curious interest, and that physicians ought to be alive to the dangers arising in a neurotic family from the attempt to care for an insane member.

Werner³¹⁴_{B.44,B.45} gives the result of an examination of forty-five cases collected from the literature. He found that the psychosis in the one primarily affected was but the momentary impulse—the spark, as it were, that lighted the train; that hereditary predisposition in the one secondarily affected was the main cause; that where heredity was not shown it was found that the cases were feeble or emotional persons, mostly women.

Legrain,⁹⁴_{Nov.} in a somewhat elaborate article, attempts to give a logical explanation of induced insanity, which is but another synonym for *folie à deux*. He believes that these, as well as the terms *folie imposée* (Lasègue et Falrot), *folie simultanée* (Régis), *folie induite* (Lehmann), should give place to the term, *folie communiquée* (communicated insanity), as employed by Maraudon. He divides the mental constitution into three types—the active, passive, and indifferent—and proceeds to give the pathogenesis of induced or communicated insanity by referring it to an irresistible, instinctive suggestion and the tendency of man to imitate. He assumes an active and passive induced insanity, and gives the differential diagnosis.

Jörger³¹⁴_{Vol.45,B.4} attempts to answer the question, What is the mode of development of induced insanity? He asserts, after a careful experimental inquiry, that insanity may be induced either by emotion or by implantation of the delusions. Between these two he gives the following table for differential diagnosis:—

CASES INDUCED BY EMOTION.

(a) The primarily diseased person plays an unconscious part in the whole process

(b) The form of the primary psychosis is of no importance in the act of inducing.

CASES INDUCED BY IMPLANTATION OF DELUSIONS.

(a) The primarily diseased person plays a conscious (?) active part.

(b) The form of the primary insanity must be a logically arranged and relatively probable delusion.

(c) The effective cause is the outward appearance of the primary psychosis (great violence, depression, etc.).

(d) The secondary (induced) psychoses are curable psycho-neuroses and simple neuroses.

(e) The form of induced psychoses is acute or subacute.

(c) Effective causes are the delusional character of the primary psychosis and the activity of the inducer.

(d) The secondary (induced) psychoses are systematized forms of delusional mania.

(e) The form of induced psychoses is subacute or chronic.

The author discusses the division of *folie à deux* into *folie imposée*, *folie simultanée*, and *folie communiquée*, and arrives at a conclusion that the latter two are not essentially different forms and that the former is but a prodrome of either.

At the meeting of the Association of Swiss Alienists, Forel²¹⁴_{Aug.} reported an instance of *folie à quatre*, as did also Wiele and Burckhardt. Woods²_{Sept.} reported at the British Medical Association a similar instance of induced or simultaneous insanity in four members of the same family.

An article by de Brun²⁴⁵_{Sept.} upon *hypochoondrie à deux* may properly be referred to in connection with the foregoing. The conclusions as to differential diagnosis between sympathetic hypochondria and sympathetic insanity [mania ?] can only be given at this time. According to the author, while in the usual forms of sympathetic or imitative insanity the person secondarily affected is influenced after the mental disturbance has set in by the one primarily disturbed, in hypochondria the secondary case becomes a pure egotist, thinking only of himself and his ills. This point of differentiation does not seem to me of great value, as the hypochondriac generally is selfish and oblivious to the influence of others, unless it be to occasionally copy their complaints in an exaggerated form.

INSANITY OF PUBESCENCE AND CHILDHOOD.

Salgó¹¹³_{Mar. 11} contributes an interesting article upon the etiological importance of puberty in insanity. He says that its real importance cannot be shown by statistics, as these cases are not, as a rule, sent to institutions for treatment until a considerable period has elapsed, and this etiological factor is lost sight of. In a certain proportion of cases puberty seems to be the sole cause of insanity, but in a greater number, hereditary forms, it is but an exciting cause. According to Tigges, 25 per cent. of all cases of insanity occur between the ages of fifteen and twenty-five. Limiting the

inquiry to those who are hereditarily predisposed, the number rises to 42 per cent. Salgó does not believe that these cases should be classed under a special name.

Fürth⁵⁷_{July 29} regards heredity, faulty education, or education by persons of disturbed mental balance, fright, fear of punishment, and similar psychical impressions, as among the important causative factors in the mental alienation of childhood. The other causes which he mentions are cerebral hyperæmia or anæmia after infectious fevers. Narcotic poisoning and masturbation do not, it would seem, contribute much to the production of insanity in children, though they have some relation when taken with other factors, especially heredity.

Psychoses of Solitary Confinement.—Kirn, of Freiburg,⁴_{Aug. 13} contributes an interesting addition to the literature of insanity among those in prison. He states that, while out of the general population three in one thousand may be said to have some form of mental disorder, in prisons the ratio runs up to three in one hundred. While at first glance it might appear that imprisonment has a disastrous effect upon psychical health, as it doubtless does, it must be borne in mind that the imprisonment is but one in a train of causative factors. Setting aside the irregular life led by many criminals, the disease which they have, etc., one must remember, he says, that many of them possess a strong psychopathic predisposition, either inborn or acquired. Kirn shows that many of the cases of mental disturbance which develop in prison come on during the early months of imprisonment, and are, therefore, not solely due to that cause. As to the different effects of solitary and ordinary confinement, he believes that the former produces a more acute and recoverable form of mental disturbance, while the psychoses resulting from ordinary confinement are of slow development and chronic in form. He thinks that the mental disturbances resulting from solitary confinement are typical, and he narrates in detail several cases. In one hundred and thirty-four cases observed he found acute hallucinatory melancholia thirty-eight times, acute hallucinatory delirium sixteen times, and acute hallucinatory mania three times.

Moral Insanity.—Italian psychiatrists have during the past year devoted much attention to the discussion of moral insanity. A lengthy translation and review of the salient features of the

discussion has appeared from the pen of Workman.⁹⁸ Verga⁴⁸⁶_{No.1,2} has a lengthy contribution upon the history and theory of moral insanity. We can only refer to one point in his paper, which now seems to be the settled view, that moral insanity is never acquired, but is a condition of defective development present from the beginning of the patient's history.

Weight of the Brain and its Parts in the Insane.—Tigges²⁹⁵_{Bd.45,H.1,2} contributes an elaborate article upon this subject, opening with an inquiry into the weight of the brain in general, from which the author draws the conclusion that not only the different European, but the different German, populations have different brain weights. The excess in weight of the male over the female brain remains constant in healthy and diseased brains among all races, and is about 8 to 9 per cent. Regarding the average brain weight, the author is unable to decide whether it is higher in the sane or the insane.

Passing to the consideration of the weight of the brain in various forms of mental disturbance, he finds, contrary to the experience of other observers, that in men the weight is higher in mania than in melancholia, while the reverse obtains in women. Secondary forms of mental disease give a lower average brain weight than primary ones. As would be anticipated, the weight of the brain in dementia is low. Paralysis (paresis) results in a low average weight, especially marked in women. The weight of the cortex, cerebellum, and "brain-stem" are next considered. Of his conclusions the following are noted:—

In the insane, as compared with the healthy, there exists a smaller ratio of weight for the cortex, a higher for the cerebellum and brain-stem. The weight of the cortex, both in the sane and insane, slightly preponderates in men as compared with women. The brain-stem is, however, slightly heavier in women. In different forms of mental disease the weight of the cerebellum remains quite constant. In general paralysis and idiocy, it maintains a much nearer approach to the healthy average than either cortex or brain-stem, but in epilepsy this is reversed.

Tigges divides the cortex into frontal, parietal, and temporo-occipital regions, and proceeds to inquire into their respective and relative weights. One conclusion arrived at by him is that in primary mental disturbances, as well as in the terminal forms of all

classes of mental disease, the weight of the frontal cortex was greater in women, while the weight of the parietal and temporo-occipital portions was less than in men.

Passing to a consideration of the relative weight of the two halves of the brain, the author finds that the *right* hemisphere of the cerebrum is heavier in the insane than the left. This he finds also true of the portions of the right as compared with the left hemisphere, except the parietal lobes, which are either equal in weight or show an excess of weight on the left side. In the sane the preponderance of weight he finds in the right hemisphere also, though to a less degree than in the insane. He confirms the thesis of Marandon that in the insane the differences in weight excel by far those observed in the healthy. As regards brain weight and age, he finds that women have their height of development partly in the same decennium as men, partly later, but very rarely earlier.

Morselli⁵⁹¹_{v.13} has written an interesting and suggestive article upon brain weight in connection with certain craniometrical examinations. His deductions are based upon examinations made upon the crania and brains of one hundred and four insane cases (fifty-nine males, forty-five females). A few of his conclusions can be presented:—

1. The brain coverings in male patients weighed 124.5 grammes, in female patients, 93.3 grammes.

2. The weight of the brain alone (average) was in female patients 1127.5 grammes, in males 1216.2 grammes.

3. The relation of the brain and membranes to the volume of the skull was in the male 91.6 per cent., in the female 92.9 per cent.

The author points out that in any comparison of brain weights the influence of the weight of the coverings, as modified by age, body length, body weight, the duration of the last sickness, etc., must be considered. The average weight of the coverings and fluids of the brain is higher in the insane than the sane, while the average brain weight is lower.

According to the same author⁷⁵_{June 15} the comparative weight of the two hemispheres in the insane, in one hundred and thirty-three cases, seventy-seven men and fifty-six women, was as follows:—

		77 Men.	56 Women.	In all.	722 Sane Persons
Right Hemisphere	Left	8.6 per cent.	12.5 per cent.	9.8 per cent.	11 per cent.
Right	Left	58.6 "	51.8 "	52.6 "	50 "
Right	Left	42.8 "	35.7 "	37.6 "	30 "

Thickness of Cerebral Cortex in the Insane.—Conini⁵⁹¹_{V.13} gives the results of an examination of the thickness of the cortex cerebri in the insane. He divides each hemisphere by incisions along the præ and post central fissures into three parts: (*a*) pars præ rolandica, (*b*) post rolandica, and (*c*) rolandica. The results given are those obtained from examinations of fifteen brains of general paralytics. The deductions are, briefly:—

1. That in general paralytics the cortex is reduced in thickness over the whole brain.
2. The greatest thickness of cortex is found in the posterior half of the ascending frontal convolution.
3. The thinnest portion is found in the pars rolandica, especially in the ascending parietal convolution.
4. In both central convolutions the cortex is thicker in the posterior than in the anterior portions.
5. The under surfaces of the pars, præ, and post rolandica are covered with a thinner cortex than the outer and median surfaces.
6. The cortex of the left hemisphere is thicker *cæteris paribus* than of the right.
7. The left hemisphere weighs more than the right.

INEBRIETY, MORPHINISM, AND KINDRED DISEASES.

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NEW YORK.

ALCOHOLIC INEBRIETY.

THE literature of the year on alcohol and alcoholism, though voluminous, presents but a meagre addition to our knowledge, with the exception of certain statistical information and some additional facts concerning the adulteration of alcoholic beverages. On the symptomatology, pathology, and treatment, and, in general, regarding the effects of alcohol on the human system, we find little more than a reiteration of former views. Too many of these opinions are vague generalizations, or are expressed with a positiveness suggestive of the emotions of the fanatic or the assurance of the charlatan. Sweeping conclusions, feebly supported by facts, are exceedingly abundant. Even the statistical collections of the year have served as a two-edged weapon for the factions to handle, and it has been used with vigor. The chief discussion has followed the publication of the Report of the Collective Investigation Committee of the British Medical Association, "On the Inquiry into the Connection of Disease with Habits of Intemperance," ² June 23 prepared by Isambard Owen.

The contributor was requested to take his death-certificate book and, from the record of the three years previous, note, of males over twenty-five years, their occupation, social position, age at death, cause of death, whether gout had occurred, and the grade of their alcoholic habit. The following classes were made: (a) Total abstainers. (b) The habitually temperate—that is, men who drink small amounts, and only with meals, and rarely take spirits, except for medicinal purposes (the latter part of the definition not to apply to whisky-drinking countries). (c) The careless drinkers—men who, without being "intemperate" or "free drinkers," yet do not confine themselves within a rigid rule, who do not demur to drinking spirits occasionally as a beverage, who may at times drink between meals, but who do not make these practices a habit,

and, on an average, do not materially exceed what has been termed the "physiological amount" of one and one-half ounces of pure alcohol daily. (*d*) The free drinkers—men who "drink a fair amount," or "take their wine freely," habitually exceeding the physiological amount to a material extent, but yet who cannot be called "drunkards" or considered to have forfeited a character for sobriety. (*e*) The decidedly intemperate—"drinking men," "hard drinkers," and "drunkards." Intermediate or sub-classes were also made, indicated by *ab*, *bc*, *cd*, *de*. Returns were received from one hundred and seventy-eight members, who reported four thousand two hundred and thirty-four cases. Of the numerous tables presented in the report the following are reproduced:—

TABLE V.—SHOWING THE NUMBER OF CASES IN EACH OF THE OCCUPATION GROUPS AND THE PERCENTAGE OF EACH GROUP IN THE SEVERAL ALCOHOLIC CLASSES.

		A.	B.	C.	D.	E.
Total	4222	3.4	38.9	26.5	15.3	15.3
Independent	176	1.9	41.9	20.3	13.8	21.5
Professional occupations	242	5.7	50.3	20.1	12.7	10.7
Clerical occupations	176	4.2	47.9	22.9	16.1	8.4
Mercantile occupations	195	3.5	43.8	13.9	21.9	16.3
Tradesmen	378	4.3	40.3	17.3	18.6	18.8
Licensed victuallers	159	. .	12.5	15.6	28.8	42.7
Artisans	807	5.6	40.6	26.8	12.3	14.2
Laborers	1185	2.5	38.5	33.4	13.3	11.4
Driving occupations	70	1.4	23.5	25.6	24.1	24.9
Farming occupations	333	1.8	42.9	28.9	14.5	11.7
Soldiers	47	4.2	15.8	40.2	12.6	26.5
Sailors	74	4.05	33.7	33.02	20.1	8.7
Domestic servants	115	1.2	23.4	37.3	16.4	21.2
Miscellaneous and blank	265	3.5	36.0	22.6	16.3	20.8

TABLE IX.—AVERAGE AGE AT DEATH FOR EACH CLASS.

Class	Years.	Years.	Days.
Class A,	51.22	or	51 80
" AB,	56.72	"	56 215
" B,	62.13	"	62 50
" BC,	62.42	"	62 155
" C,	59.67	"	59 246
" CD,	60.35	"	60 130
" D,	57.59	"	57 216
" DE,	53.64	"	53 233
" E,	52.03	"	52 14
Unclassified,	60.91	"	60 334
Total,	58.92		58 336

Dr. Owen's conclusions, drawn from the facts, are stated as follows:—

"On the whole, then, in addition to the information that we

obtain from these returns as to the alcoholic habits of the inhabitants of this country, and as to the relative alcoholic habits of different occupations and classes, we may not unfairly claim to have placed upon a basis of fact the following conclusions:—

“1. That the habitual indulgence in alcoholic liquors beyond the most moderate amounts has a distinct tendency to shorten life, the average shortening being roughly proportional to the degree of indulgence.

“2. That of men who have passed the age of twenty-five, the strictly temperate, on an average, live at least ten years longer than those who become decidedly intemperate. (We have not, in these returns, the means of coming to any conclusion as to the relative duration of life of total abstainers and habitually temperate drinkers of alcoholic liquors.)

“3. That in the production of cirrhosis and gout alcoholic excess plays the very marked part which it has long been recognized as doing; and that there is no other disease anything like so distinctly traceable to the effects of alcoholic liquors.

“4. That, cirrhosis and gout apart, the effect of alcoholic liquors is rather to predispose the body toward attacks of disease generally than to induce any special pathological lesion.

“5. That in the etiology of chronic renal disease, alcoholic excess, or the gout which it induces, probably plays a special part.

“6. That there is no ground for the belief that alcoholic excess leads in any special manner to the development of malignant disease, and some reason to think that it may delay its production.

“7. That in the young, alcoholic liquors seem rather to check than to induce the formation of tubercle, while in the old there is some reason to believe that the effects are reversed.

“8. That the tendency to apoplexy is not in any special manner induced by alcohol.

“9. That the tendency to bronchitis, unless, perhaps, in the young, is not affected in any special manner by alcoholic excess.

“10. That the mortality from pneumonia, and probably that from typhoid fever also, is not especially affected by alcoholic habits.

“11. That prostatic enlargement and the tendency to cystitis are not especially induced by alcoholic excess.

“12. That total abstinence and habitual temperance augment

considerably the chance of a death from old age or natural decay, without special pathological lesion."

Attention is called to Table IX, which shows that the average age of the total abstainer is not only far below the average age attained by moderate drinkers, but even a year below that reached by the decidedly intemperate. Owen explains this by the statement that the total abstinence movement has made more converts among the young than among the middle-aged or elderly, so that, as a class, they contain a greater number susceptible to early death. It is this showing, that the duration of life is shorter among the total abstainers than in any other class, which has met with incredulity on the part of critics, notwithstanding Owen's explanatory statements; one writer ⁶²_{Sept.} bringing it forward against the reliability of statistics in general.

An extensive correspondence ⁶_{July & Aug.} has been carried on between Owen and his adherents and their opponents. In this nearly profitless discussion are included the names of Kerr, Joy, Ridge, Roberts, King, Drysdale, Hardy, Lowndes, and Smith, of England. Kerr has objected that the cases were too few from which to draw conclusions, and that the data were obtained from memory of past deaths, while such statistics should be made up from future deaths for a prescribed period. Owen's report contained an appendix showing the results of Neison's inquiry, made forty years ago, by which it was found that the death-rate among the very intemperate was about five times that of the general rate, and also the result of the Harveian Society's statistical work, based on one thousand cases, indicating that among the intemperate class there is a four-fold increase in deaths from disease of the liver and chylopoietic viscera; a two-fold increase in renal disease; a marked increase from pneumonia and pleurisy; a considerable increase and an earlier occurrence from disease of the central nervous system; a decrease of half as much again from heart-disease; a marked decrease from bronchitis, asthma, emphysema, and congestion of the lungs; a decrease nearly as great from phthisis, with a later occurrence or termination of the disease; a very large decrease in death from old age. It is claimed that in the main these results correspond to those of the Collective Investigation Report respecting liver, kidney, and nervous diseases, phthisis, and old age; but not as to bronchitis, pneumonia, and cardiac disease.

Harley's articles ^{Feb. 25} upon "The Effect of Moderate Drinking on the Human Constitution ; Its Influence on Liver, Kidney, Heart and Brain Diseases " have attracted considerable attention. They are also chiefly upon a statistical basis. He defines " moderate drinking " as the indulgence of alcoholic stimulants " well within the margin of actual drunkenness." Of moderate drinkers there are two classes: those who take stimulants only at meals and those who partake of them between meals. The latter habit is known in England as " nipping." He regards it as the most pernicious of all forms of drinking. This he attempts to prove by statistics. In the absence of especial tables of mortality due to this form of drinking, he adopted the plan of estimating its effect on health by comparing the death-rates of persons who in their vocations are exposed to the temptation of taking small quantities of alcoholic stimulants between meals, with the recorded death-rates of those whose trades and modes of life do not so expose them. The following tables are given from the Registrar-General's Reports:—

DEATH-RATE OF MEN BETWEEN THE AGES OF TWENTY-FIVE AND SIXTY-FIVE.

Men Exposed to the Temptation of "Nipping."	Circulatory Diseases.	Nervous Diseases.	Liver Diseases.	Kidney Diseases.
Commercial travelers	100	139	61	44
Brewers	140	144	96	55
Innkeepers, publicans, vintners, farmers, and waiters	165	200	240	83
Men Not Exposed to the Temptation of "Nipping."				
Gardeners and nurserymen . .	75	63	18	39
Printers	82	81	28	30
Farmers and graziers	90	90	41	31
Drapers and warehousemen . .	93	109	35	37

I am willing to admit Harley's statement that " nipping " is the most pernicious form of drinking, but am not satisfied to accept his statistics as proof. The conclusions are somewhat misleading. In the first place, his definition of moderate drinking is not a practical one for the purpose. Well within the margin of actual drunkenness will frequently include the barkeeper who has become accustomed to large and frequent drinks which fail to induce drunkenness, and the brewer who drinks from twenty-five to fifty glasses per day while following his occupation. These, surely, are

not "small quantities," nor is it moderate drinking in the usual sense of the term, though it may be well within the margin of actual drunkenness. Again, in selecting his "nipping" classes, he has taken men not only "exposed to the temptation of nipping," but exposed to exceedingly immoderate drinking, and to many other temptations also deleterious to health. Commercial travelers are, notably, a class exposed to irregular habits of all sorts in addition to alcoholic excesses, which are not infrequently carried well *over* the margin of actual drunkenness. Brewers' hands, we are told by Mr. Thoman, of the U. S. Brewers' Association, ¹⁵⁷₁₅₇ consume on an average 25.73 glasses of beer per day, about ten pints, a considerable number drinking fifty glasses per day. Is this a moderate drinking class? Innkeepers, publicans, vintners, barmen, and waiters are included in the nipping class, but in most of these occupations there are other degenerating causes, such as an indoor life, with long working hours, in a bad atmosphere. May it not be rather a combination of degenerative habits which produces the result than the alcoholic habit alone? Surely gardeners and nurserymen, farmers and graziers, should tolerate even immoderate alcoholic indulgence better than indoor workers. Great as the importance of the habit of "nipping" must be in producing the diseases mentioned, yet do not these statistics tend to exaggerate its importance as a factor, for the reasons named?

Dr. Pietra Santa, our Paris corresponding editor, has furnished an account of investigations upon the consumption and quality of alcoholic beverages in France which, however, is too extended to be produced entire. It refers to the report of Léon Say, ordered by the French Government, on reforms in legislation respecting alcohol and the regulation of alcoholic beverages; also the report of Debray and the experiments ¹⁰_{Oct. 2} of Laborde. The work of Laborde and Magnan on the intoxicating effects of alcohol, of the higher alcohols, and of artificial bouquets are of great interest. The experiments were made upon dogs by intravenous injection of the different substances; a method objected to by Dujardin-Beaumetz on the ground that more and different toxic effects might result by direct contact of these agents with the blood, possibly producing local alterations in the blood itself, than when absorbed by the stomach. Laborde contends, however, that with these highly diffusible substances the effects do not greatly differ, whatever the

method of introduction. He attempts to show that the artificial bouquets are far more toxic than pure ethylic alcohol, some of them having a convulsivant action. The so-called "essential oil of wine" (of which there is a French and a German preparation, the latter being the most toxic) is produced by the action of nitric acid on oil of cocoa, castor-oil, butter, or other fatty matters. This oxidizing effect results in the formation of caproic, caprylic, and capric acids, and these produce, under pressure with alcohol, ethers of the methylic, ethylic, amylic, propylic series. A small quantity is sufficient to give bouquet to a large quantity of wine. The injection of from four to eight cubic centimetres of this oil of wine into the external saphenous vein of a ten-kilogramme dog results in death in little more than an hour. The symptoms are general excitement, vomiting, plaintive cries, hurried respiration, then a fall of temperature, violent vomiting of muco-sanguinolent matter, defecation, failure of muscular power, collapse, and death by asphyxia. The autopsy reveals bloody suffusions in the lungs, chiefly in the lower lobes, and marginal emphysema; the heart soft, flaccid, filled with diffuent blood, with punctiform ecchymotic spots beneath the endocardium; the mucous membranes of the stomach feebly injected, the kidneys injected, liver congested; diffuse injection of the meninges and cerebral tissues, nothing appreciable in the medulla or pons. Commercial alcohol also contains several aldehydes which are toxic to a high degree, producing true epileptic attacks. One of these, found chiefly in alcohols made from oats, rye, and barley, is "furfurole," or pyromucic aldehyde. The essential bouquets of various *liqueurs* have also a convulsivant action similar to absinthe and vermouth. One of these, a substitute for essence of "queen of the meadows" (*Spirea ulmaria*), is salicylic aldehyde, $C_7H_6O_2$, a phenol aldehyde. The salicylate of methyl, a substitute in vermouth for wintergreen essence, is also classed as a convulsivant, though rarely producing more than rigidity and trembling. Another dangerous substance is the *essence de noyau*, or almond essence, containing benzonitril and benzoic aldehyde. This is so volatile that alarming symptoms were experienced by Laborde and his assistants from its unavoidable inhalation in their experimental work with it; vertigo, faintness, profuse perspiration, palpitation, and tremor resulting. Of the non-convulsivant substances, several groups are given:—

1. Those which produce grave or fatal effects, such as cinnamic aldehyde, cinnamate of ethyl, and the bouquet essences of Irish whisky, London gin, Holland gin, cherry brandy, Dutch bitters, and kirsch. 2. Those that are not fatal, but decidedly injurious, such as benzoates of amyl and of methyl, acetate of amyl, butyrates of ethyl and of amyl, succinates of ethyl and of methyl, the valerianate and the cœnanthate of ethyl, malate of methyl, acetal, methylal, amyltartaric acid, etc., etc. 3. Those that are comparatively harmless, as the essences of rum, cassis, cognac brandy, curacao, kümmel, maraschino, benedictine, *anisette de Paris*, grenadine, etc.

The importance of thorough rectification of alcohol to be used in beverages is shown by experiments upon dogs, in which alcohol made from wine, from beets, and from corn was administered by the stomach. The intoxicating effects were slight with alcohol of wine, more with corn alcohol, and most with beet alcohol. The effects of pure ethylic alcohol obtained from these alcohols of wine, corn, and beets were alike for the three kinds. The residua of distillation produced profound effects proportionate to the greater toxic action of the alcohol from which they were derived. Lancereaux views the convulsive phenomena observed in man from the toxic effects of alcoholic drinks as hysteroid rather than epileptic, but Laborde is convinced that true epileptic attacks result therefrom. As a result of his researches, the latter lays great stress upon the importance of more stringent regulations for the manufacture of alcohol and the prevention of adulteration of alcoholic drinks, attributing a large part of the noxious effect of alcoholic beverages to the toxic substances which he describes. Notwithstanding the importance of these investigations, and admitting the long-known fact that many of the higher alcohols and aldehydes are far more toxic than ethylic alcohol, I cannot forget the teaching of Prescott, who, after careful researches, finding that the percentage of such other substances was small, declared that, after all, to ethylic alcohol must be attributed almost the entire injurious effect of alcoholic beverages. The small amounts of the more toxic substances are but trifles compared with the far larger quantity of the lesser toxic agent, which is sufficiently intoxicating to account for nearly all the injurious effects that follow its immoderate use.

The translator of an article from the Spanish ²⁶_{Sept. 1} states that

"good mature cognac twenty years in cask has really about three times as much of these reputed maddening agents and quite as much amyl (fusel-oil) as the ordinary potato spirit which, colored and flavored, is sold in the British public houses as genuine French brandy. In commercial spirit it rarely reaches 1 per cent., and is generally not more than .1 to .2 per cent. of the volume. Good silent spirit in the form of rectified spirit of wine and containing 84 per cent. of alcohol is almost absolutely pure, and with the necessary coloring and flavoring with cœnanthic ether makes about three times the bulk of brandy, or, with a little turpentine and old oil of lemon, four times as much gin, and as far as purity is concerned is immeasurably better than the best *cœu-de-rie* Bordeaux ever sends us. So that we have the anomaly that the factitious article is really better and purer than the genuine and at about one-fourth its cost." Pesit²⁶_{Sept. 1} suggests that some of the toxic effects of alcoholic drinks may be due to ptomaines or leucomaines originating in the process of fermentation.

Strassmann⁵⁷_{Oct. 14} observed that dogs fed on pure alcohol lived twice as long as those fed with alcohol containing 3 per cent. of amyl alcohol. A third group, fed with brandy containing 1.5 per cent. of fusel-oil, though exhibiting more marked symptoms of intoxication and more decided fatty degeneration of the liver, lived as long as those fed on pure alcohol. He concludes that no appreciable difference would result in man between the use of drinks containing pure alcohol and those containing 0.3 per cent. of fusel-oil. He was unable to confirm Mairet and Combemale's observations concerning psychical disturbances, except drunkenness. He found gastric catarrhal conditions and fatty livers only, as pathological effects, and concludes that advance in the pathological anatomy of chronic alcoholism must come through observation upon man rather than by means of experiments upon animals.

Mairet and Combemale's³_{Mar. 14, 28; Apr. 7} experiments on dogs show the degenerative effect of alcoholic liquors on descendants. A male dog was kept intoxicated with absinthe for a long time, until chronic alcoholism was induced, and was then copulated with a healthy young bitch; of the twelve puppies subsequently born two were born dead, the remainder dying within two months. Some had epileptic attacks, others had intestinal troubles, and several had pulmonary or peritoneal tuberculosis. The cranial

bones were thickened, with dura adherent; variations in weight between the two hemispheres were found, also fatty degeneration of the liver. In a second case, a vigorous bitch was kept intoxicated with alcohol during the last three weeks of gestation. She gave birth to six puppies, three of which were born dead. The remaining three were not intelligent, though not deformed; one of them, a female, was raised with difficulty, and in order to show the effects upon the second generation was impregnated by a healthy male dog. Of the three puppies born, one had a club-foot and an atrophy of several toes, another died of athrepsia and had patency of the foramen ovale of the heart, the third had atrophy of the hind legs and tabes mesenterica. The authors conclude, from experiments on dogs fed with eight grammes (two drachms) of alcohol per kilogramme (two pounds) of weight of body per day, that chronic alcoholic intoxication induces in animals fits of delirium, with ideas of fear and hallucinations of the senses, accompanied by intellectual debility, muscular disturbances of an ataxic and paralytic nature, beginning in the hind legs and soon becoming general, the autopsies revealing diffuse meningo-encephalitis and vascular dilatation of the cerebral centres.

Z. Pupier^{40 13 5}_{May 16; Sept. 16; July} has studied the effects of alcoholic liquors (red wine, white wine, absinthe, and alcohol) on the livers of hens and rabbits. In hens killed after two or three months' feeding on alcohol the liver was found smaller and of a color different from normal. Absinthe produces interstitial hepatitis with the formation of connective tissue, resulting in destruction of the liver-cells and the development of a true cirrhosis. Red wine brings about fatty infiltration of the liver-cells without increased vascularity. White wine causes shrinking of the liver-cells, atrophy, and resulting sclerosis of the connective tissue and vascular system, both parenchymatous and interstitial hepatitis being evident. With pure alcohol isolated spots of interstitial hepatitis, atrophy of the liver-cells, and vascular dilatation were found; a decidedly less cirrhotic appearance than that produced by absinthe.

Readers are referred to an interesting article by J. Matthew Duncan,³⁶_{Apr} too extensive to give entire and too discursive to summarize, on "Alcoholism in Gynecology and Obstetrics," in which he calls attention to the effects of habitual drinking ("soaking") in producing menorrhagia, vesical and vaginal catarrhs, chronic

ovaritis, sterility, delirium tremens, after operations and in the puerperal state, and in causing miscarriage and degenerated offspring. It is made up rather of citations and comments upon views of the older authors than of exclusively original observations.

Two cases of so-called "febrile delirium tremens" are reported, and the subject well presented, by Bullard.⁹⁹
Feb. 9

Treatment.—Extended articles on the subject of asylum management of inebriates and inebriety in general have been written by Baker,⁹⁸ Crothers,¹³⁸ Mamm.¹³⁷ in the United States; Clark,³⁹ of Canada, and Kerr,²² of England, in which great stress is laid on the theory of inebriety being the result of a diseased nervous system rather than of a vicious habit, and on the indispensability of asylum treatment for such cases. On the part of some of these writers, remarkable claims are made for the curability of such cases under such treatment. I am unable to discover in these articles any new facts or new details of treatment of importance, though they contain good *résumés* of familiar methods.

Forel,³⁴⁹⁰ who has become an earnest advocate of the total abstinence movement, is opposed to the administration of alcoholics in the treatment of alcoholism, even in delirium tremens. Following upon recovery of abstinence symptoms, he tries to induce the patient to join a temperance society to obtain the social benefits of temperance surroundings. Failing in this, he endeavors to obtain a pledge of total abstinence; when this is objected to, he has resort to hypnotic suggestion to bring about the result, and believes that in hypnotism we have a valuable aid to treatment. Of thirty-four cases of habitual intemperance under asylum treatment, ten could not be induced to think of abstinence at all, and, though some were hypnotized, they could not be influenced. Of the remaining twenty-four, twenty were induced to join a society, and hypnotism was employed to persuade twelve of them; of these twenty, eight are known to have adhered to their pledges, four being cases which had been hypnotized and four cases in which it was not tried, five returned to their old habits, four of whom had been led to join the society by hypnotization. The result was doubtful or unknown in six cases. Of four who pledged without joining the society two kept their word; with the other two the result is unknown. None of these were hypnotized.

Strychnia has recently been brought into greater prominence as a remedy for alcoholism among the Russian physicians following upon Jaroskevsky's experiments, ²⁶_{May 1} chiefly upon dogs. His conclusions are that strychnia most decidedly enables the animal organism to receive large quantities of alcohol for a prolonged period without any apparent injury to the central nervous system. It can be recommended in all forms of alcoholism. The best results, however, may be expected in the so-called neuropathic or nervous varieties of alcoholic intoxication. The drug will probably prove less useful with classical hepatic cirrhosis. This is also Zavatsky's ²⁶_{Aug. '87} opinion.

V. Krafft-Ebing ¹¹⁶_{Feb.} has brought methylal again into notice, using it subcutaneously. This drug, described by Malaguti in 1839, was recommended by Nicot internally for gastralgia and enteralgia, and hypodermatically as a hypnotic and as the best antidote against strychnia. Richardson ⁷²¹_{Feb. 19, '87} used it in 1868 as an anæsthetic and hypnotic. Personi experimented with it upon dogs in 1886 and found that it produced anæsthesia, deep sleep, and abolition of the reflexes when given by injection, 0.1 to 0.15 gramme ($1\frac{1}{2}$ to $2\frac{1}{4}$ grains) per kilogramme (2 pounds) of weight, 2.0 grammes (31 grains) producing paralysis and death, in which case cerebral hyperæmia and capillary hæmorrhages in the lungs and heart were found. Lemoine ⁵⁵_{Apr. '87} observed reduction of blood pressure and slowing of the pulse in 2.0-gramme (31 grains) doses, internally, in man. Mairet and Combemale ⁷³_{July 2, '87} found it useless in alcoholic insanity, melancholia, and mania at the beginning, but useful at their height, and also in senile and paralytic dementia, in doses of 5.0 to 8.0 grammes ($1\frac{1}{4}$ to 2 drachms) internally. No injurious effects were observed even after continued use. Petrozzani ⁵⁹¹_{V. 13, p. 246} obtained similar results with insane patients in 8.0-gramme (2 drachms) doses. V. Krafft-Ebing, on the advice of Merck, uses it hypodermatically in the form of an aqueous solution of one to ten, each injection dose containing 0.1 gramme ($1\frac{1}{2}$ grains) of methylal. Effects were not noticed under about two hours. The dose was repeated if sleep was not produced in two or three hours. Twenty-one cases of delirium tremens are reported, about one-half of them being mild. In six instances sleep was produced by one injection, in ten, by from two to four; in three, by from five to eight, and in two, by from

ten to twenty. He regards this drug as the best sedative he has ever employed. It does not depress the heart or produce any unpleasant after-effects. He thinks it may be useful in insomnia and restlessness due to inanition and cerebral anæmia, but not in hyperæmic states. It failed in ordinary alcohol intoxication.

Anderson⁴⁰_{May} praises the effects of a large dose of calomel (20 grains, 1.3 grammes) in quieting delirium after narcotics, hypnotics, anodynes, and sedatives had failed.

Schenck,⁷²_{Jan.} for the same purpose, gives ten-drop doses of Squibb's fluid extract of ipecacuanha every fifteen minutes until emesis is produced.

Neely⁷⁴_{Jan.} recommends the subcutaneous injection of pilocarpine in acute alcoholism, having used it successfully in nine cases. He concludes that in pilocarpine we possess an agent of great value in acute alcoholism which will shorten the duration of an attack and establish convalescence much more quickly than any other drug, its motor depressant and paralyzant effect causing it to act promptly, decisively, and safely when judiciously used. Its minuteness of dose renders its administration easy. It is to be employed in all cases exhibiting exaltation of nerve force and derangement of the secretory system, but not when depression exists or is about to occur. The dose must be sufficiently large ($\frac{1}{5}$ to $\frac{1}{2}$ grain, 0.3 to 0.76 gramme, in the author's cases) to produce full physiological effects; small doses repeated accomplish no good whatever. Its action must be supplemented by other remedies as the exigencies of the case demand.

MORPHINISM.

The ANNUAL of 1888 (vol. iii, p. 421) contains an excellent digest of prevailing views on the morphine habit and its treatment, by the former editor of this department. The literature of the past year modifies these views but little.

The third edition of Erlenmeyer's work has called forth several almost universally favorable reviews (Averbeck,⁴¹_{Jan. 16} Donath,⁸¹_{Jan. 28} Sharkey,⁴⁷_{Jan.} and others). Erlenmeyer regards the therapy of morphinism as threefold. It consists (1) in discontinuing the morphine, (2) in combating the symptoms due to its removal, (3) in guarding the patient against a relapse into his former habit. The general principles of treatment are: (1) to institute the quickest possible

reduction of the morphine consistent with safety, in order that more time may remain for convalescence, *i.e.*, for the recovery of physical and mental strength, and (2) to prevent the secret supplying (smuggling) of narcotics. Three methods of discontinuing the morphine are recognized, namely, gradual weaning, immediate withdrawal, and rapid withdrawal. By the first method the dose is gradually reduced, the object being to lessen the severity of the abstinence symptoms. Its disadvantages are (1) the difficulty in preventing the patient from smuggling morphine, (2) the prolongation of the period of abstinence phenomena, and (3) consumption of the entire disposable time of the curative period, leaving no time for convalescence, without which permanent recovery is impossible. He considers it, therefore, an unsuitable procedure. In the method by immediate withdrawal the morphine supply is cut off absolutely and at once on entering the institution; the patient is isolated and closely watched, remaining most of the time in bed. The disadvantages of this plan are the difficulty in carrying out such stringent isolation and the danger to life consequent upon the sudden withdrawal of the drug. By the rapid method the morphine is not discontinued abruptly, but reduced as rapidly as possible consistent with safety to life. This is the plan adopted by Erlenmeyer, who occupies from six to twelve days in the withdrawal, according to the patient's age and condition, the size of the dose, the duration of the habit, etc. Small doses of 0.3 to 0.5 gramme (5 grains to 3 grains) may be discontinued in from three to six days, and doses of from 1.5 to 2.0 grammes (23 grains to 31 grains) in ten days without collapse or notable cardiac or respiratory disturbances. The accustomed dose is reduced one-half at the beginning and the remaining dose divided in half once or twice afterward. The evening dose is retained the longest, as it promotes sleep. The abstinence symptoms are more decided than under "gradual withdrawal," but far less severe than by the "immediate method," the most distressing symptoms lasting but a few days, while gradual weaning prolongs them for weeks. The chief advantages of the rapid method are its absolute safety to life by the avoidance of collapse, the certainty of discontinuing the habit, the short duration of the withdrawal period, and the extension of the period of convalescence.

Removal to a special asylum for the cure of the morphine habit

is recommended as by far the best procedure. The rules of such an institution should require the most thorough inspection of the patient's clothing and other effects on his reception to detect concealed morphine or other narcotics, and measures that will prevent the obtaining of these drugs after his reception, such as the removal of money or valuables in his possession, and control of his correspondence, also the strict instructions to attendants, closely watching the latter as well. The most dangerous symptom of morphine abstinence is collapse, for the patient's life is actually in danger. The best remedy, and one which, if promptly used, will effectually remove all signs of collapse, is morphine. A hypodermic injection of 0.025 gramme ($\frac{3}{10}$ grain) should be given on the appearance of irregularity of the pulse and respiration, pallor, or the sensation of swooning. If amelioration does not promptly follow, the dose should be repeated, if necessary, two or three times. Ether injections are not of value (Ball⁹¹ recommends sparteine). Cutaneous irritation and dry warmth may be applied to the body, and with respiratory failure, faradization. The supportive effects of tea, coffee, and alcohol may be useful accessories, and may also be employed to correct moderate delirium, but maniacal delirium requires a few injections of morphine. For vomiting, brief abstinence or reduction of food, the use of ice and champagne, is usually sufficient, but in violent emesis morphine may be required. Diarrhœa usually appears a day or two after the last injection of morphine. If it does not it should be induced by laxatives, otherwise more disagreeable symptoms may supervene, such as mental unrest. If the diarrhœa becomes severe the usual methods of controlling it may be employed, as opium mixtures, astringents, and strychnia.

For insomnia and restlessness Erlenmeyer recommends chloral at night in 2.5- to 3.5- gramme (38 to 54 grains) doses, after having given six grammes (90 grains) of some bromide salt during the day. Averbek warns us against the use of chloral, its effect being decidedly more pernicious upon the brain than that of morphine. Erlenmeyer discards urethan as useless and paraldehyde as too offensive. Rest in bed is the best means of controlling general restlessness. A nutritious diet must be maintained during the abstinence period, aided by alcohol if necessary. Milk is the chief reliance in many cases. Warm baths 25° to 27° R. (88° to 93° F.) of fifteen to thirty minutes' duration are beneficial,

but cold-water applications are often injurious. Fresh air is a powerful recuperative agent in the abstinence period, and as soon as possible several hours a day should be spent out-of-doors. Gymnastics should be avoided or carefully employed for some time after the withdrawal of morphine. Respecting the value of cocaine in combating the morphine abstinence symptoms, though Erlenmeyer admits that cocaine relieves the symptoms, he regards the effects of this drug, which is not an antidote, but only a substitute for morphine, as too brief; while its action in producing vaso-motor paresis renders its continual use dangerous to the vascular system. A more favorable view of its value is expressed⁸ by Obersteiner. Erlenmeyer considers that the intermittent fever described by Levinstein results from abscesses and other traumatic inflammations due to the injecting needle. He states that the absence of morphine in the urine is unreliable as a proof that it is not being taken. He finds that sphygmographic tracings show paralysis of the vascular wall and diminished pressure during the abstinence period. Injection of morphine in this state causes contraction of the vessel, with increased pressure. As pointed out by Sharkey,⁴⁷ this is directly contrary to Jennings' observations.⁶

Levinstein⁶⁹ has discussed the important question of how the patient shall be managed after the discontinuance of morphine or cocaine and the subsidence of abstinence symptoms. The whole matter, he thinks, resolves itself, as far as an absolute cure is concerned, into protection against relapse. He points to the high percentage of relapsing patients, and shows that it is during the period following the withdrawal of the drug that the will is weakest, the expression of an exhausted nervous system. The entire theory consists in careful supervision and observation of the patient, stringent avoidance of the misuse of alcohol, and the greatest possible prevention against unpleasant mental impressions. He is opposed to having friends or relatives remain with them in an institution, a procedure allowed by Erlenmeyer, as they cannot usually be brought under the control and discipline of the physician. Too long detention of the patient in an institution is also detrimental; associations are formed between patients which are demoralizing. They converse about their experiences with morphine and plot to deceive the physicians and attendants. He

recommends, as against Erlenmeyer's plan of detaining the patient for four or five months in an asylum, that after a six or eight weeks' course of treatment the patient should be placed under the constant and personal supervision of a wife, near relative, friend, or physician, who should encourage his efforts at occupation and amusement, seeking to strengthen his will-power, warning him against his danger, and preventing him from resuming his former habit. This watchfulness should be continued for at least a year.

Wilson¹⁴⁴_{May} gives a good *résumé* of treatment, in which he follows quite closely the plan of withdrawal employed by Erlenmeyer. Concerning the after-treatment, he advises two or three weeks' watching and careful seclusion from acquaintances, after which, under the supervision of a nurse or attendant, the patient may be sent to the country or sea-side, and after a month or six weeks, he says, many are able to return to their former occupation. To me this seems too short a period of supervision to prevent relapses in the majority of cases.

Gradual weaning has still an advocate in Wagner.⁶⁹_{Apr 12} who reduces the strength of his hypodermic solution by degrees, thinking to deceive his patient. It is found that the weaker solutions are more apt to produce irritation and abscesses. He admits that the method is only applicable in cases which have not relapsed from former treatment, and where the dose of morphine has not exceeded one gramme (15 grains) per day.

Kaczorowski⁵⁵¹_{Nov 28, 29, '87; Aug 4} recommends that after the sudden withdrawal of morphine a mixture be administered containing tincture opii twenty parts, tincture iodini two parts; twenty drops to be taken every two hours, day and night. The opium partially takes the place of the morphine, and the iodine, as an antifermentative, maintains the appetite and makes possible normal and efficient digestion, vomiting and diarrhoea are rare, the symptoms of deprivation are mild and harmless, the dose is gradually reduced to nothing, and the cure is soon complete. In the face of the experiences of many reliable observers, it is difficult for me to believe that such advantages could result from such a procedure except when the former doses of morphine have been very small. Erlenmeyer claims that the vomiting and diarrhoea result from the want of morphine, and not from local disorders of the mucous membrane.

Obersteiner, corresponding editor, writes⁸_{No. 15} that cocaine has

been given in a faulty and injurious manner in treating the morphine habit, and that it may be used without danger and with the effect of greatly ameliorating the fearful suffering of the abstinence period if given according to the following rules: 1. Cocaine should not be administered until the abstinence symptoms begin to be severe; usually from twenty-four to forty-eight hours after the last dose of morphine. 2. Cocaine should not be given hypodermically, but by the mouth; best in an aqueous solution to which some salicylic acid has been added, preventing growths in the liquid for months. 3. Doses should range from 0.05 to 0.1 gramme ($\frac{3}{4}$ to $1\frac{1}{2}$ grains) several times a day, according to necessity, but a daily quantity of 0.5 gramme ($7\frac{1}{2}$ grains) should not be exceeded. 4. On the second or third day the dose should be rapidly reduced and not continued longer than five or six days. The slightest sign of cocaine intoxication demands even an earlier discontinuance, and under no circumstances its resumption.

E. C. Mann, collaborator, finds the new hypnotic, sulphonal (Bayer), very valuable in combating the insomnia met with in morphine habitués, especially after the morphine has been entirely withdrawn. It produces a natural, healthy sleep of from six to eight hours, with no disagreeable after-effects, and he has not observed any interference with digestion, respiration, or the heart's action. He did not obtain the same effect from other preparations of sulphonal.

Mattison's view,¹⁹_{July 7} that the untruthfulness of opium habitués has been overestimated, did not meet with confirmation from those who discussed his paper (Spitzka, McLaury, Brill, Wood), nor does the literature of the year exhibit any change of opinion supporting his claim.

The effect of the morphine habit in the mother upon infant mortality is such, according to Erlenmeyer, that newborn children of female morphine habitués are apt to suffer from collapse, which may end in marasmus and death unless opium be given them. Earle¹³⁹_{Jan} corroborates this in reporting the case of a mother addicted to the use of morphine, who had lost four children a few days after birth, apparently before the flow of milk had been fully established. The children were healthy when born and no evidence of syphilis was obtained. He advises in such cases the administration to the child of some form of opium, or a substitute, in

diminishing doses. Kiernan, who discussed Earle's paper, cited Murrell, ²₁₈₈₁ Calkins, ¹⁰⁶⁴₁₈₇₁ Amabile, ⁷¹⁹₁₈₈₇ Levinstein, ¹⁰⁸⁵ Hubbard, ¹⁰⁹⁶_{June 9} and cases of his own in support of a similar opinion. He believed that the mother would abort if deprived of opium. Shoemaker ⁶⁰_{June 9} has contributed additional cases of this sort. Meyer, of Naples, corresponding editor, reports experiments by Tubini ⁵⁸⁹_{May} on the milk of dogs and goats that had received considerable quantities of morphine by injection. The presence of morphine in the milk was tested by Dragendorff's method, and was found in the goat's milk but not in that of the dog. The negative result in the latter case is attributed to the small quantity of milk obtained for testing.

Roller ⁴_{Nov. 26} has observed cessation of menstruation in cases of insanity treated by morphine injections for a continuous period, with return of menstruation upon cessation of the morphine. He reports seven cases, mostly of melancholia. Sherman ¹⁸⁶_{Nov. 8} and Irion both state that they have found menstruation seriously interfered with or entirely suppressed in nearly all cases of the morphine habit.

Brock ⁸¹_{Apr.} reports three cases of tetanus associated with the morphine habit, and reaches the conclusion that tetanus may be established by the use of a foul syringe or a filthy solution of morphine contaminated by the presence of the pathogenic germ on which tetanus depends, or from morphine rendered impure by one or more of the tetanous group of alkaloids, whose action on the spinal cord is scarcely distinguishable from true tetanus. A caustic editorial ¹²_{Nov.} attempts to show that his conclusions are entirely unwarranted, from the fact that his cases show nothing more than a coincidence; that the coincidence of tetanus with the opium habit is an exceedingly rare one, and that he should have furnished proof that the impurities mentioned do actually occur in our commercial morphine in a sufficient quantity to produce the effects described.

The following opinions on the effect of opium smoking upon the Chinese are of interest. Little ²²_{Apr. 25} says: "As for its pernicious effects, I look upon the money spent and the time wasted upon it as far worse than its direct effects upon health. In China, where the wages of a workingman barely keep body and soul together, the money spent on opium is withdrawn from his daily food, hence the half-starved appearance of opium smokers among the poor and

the cruel destitution their families often suffer, much as with the grog-drinking class at home. But how many opium smokers in easy circumstances does one meet with seriously injured by the drug! I have never met with one myself during a twenty-five years' stay in the country and extensive intercourse with natives of every class. To a well-nourished Chinaman his evening pipes are a mere pastime, a means of passing the time pleasantly in a state of placid inactivity dear to the Oriental, while the merchant conducts many of his best bargains over the pipe, much as negotiations are conducted over a bottle of wine at home."

In his annual report, the Colonial Surgeon of Hong Kong says the experience obtained from the Hong Kong jail is that the habit of opium smoking is far less deleterious than spirit drinking. Old, confirmed smokers were often found with a healthy digestion, and the suffering attributed to the deprivation of opium (which was not allowed to any one in the prison) was not more than in the case of a tobacco smoker deprived of his pipe—no evidence of genuine suffering and retention of the average weight.

Hashesh Smoking.—Fieelde, ⁸⁰_{July 16,} gives a graphic description of his personal experience in smoking the *cannabis indica* of Siam, the *kang cha*. It is too extended an article to reproduce, but is valuable as a psychological study. The natives smoke the flowers of the plant in a brass pipe, the fumes passing through water. The permanent consequences are yellowness of the eyeballs, pallor and greasiness of the skin, flabbiness of the muscles, emaciation, and gradual destruction of mind and body.

THE COCAINE HABIT.

Obersteiner, of Vienna (corresponding editor), describes the effects of chronic cocaine intoxication as follows: Physically there is the rapidly developing marasmus so characteristic of chronic cocaine intoxication. Psychically, we find feelings of apprehension, delusions, chiefly of persecution, and hallucinations, visual or sensory. Frightful forms appear everywhere, or small living things creep upon the skin. Insomnia, loss of appetite, and impotence complete the picture of cocainism.

Concerning the abstinence symptoms of cocaine there are two important points: (1) they may not appear until several weeks after the withdrawal of cocaine; (2) they are much more obstinate than

those of morphine and may last for months with full intensity. The psychical phenomena are similar to those described above and of variable intensity. It is important to note that symptoms of collapse are very frequent. The use of cocaine for the treatment of the morphine habit should, therefore, be used with extreme caution, according to the rules which the author has given. (Morphinism, p. 18.)

V. Zanchevski, of St. Petersburg, ^{May 26} has published some observations on the pathological changes found in the bodies of animals poisoned by cocaine. The experiments were made in two series. In the first series the animals (dogs) were given hypodermically a single lethal dose of cocaine—viz.: 0.03 gramme ($\frac{1}{2}$ grain) per kilogramme (2 pounds) of the weight. In the second series of dogs chronic poisoning was induced by the subcutaneous injection of a much smaller quantity—about a fifth part of the lethal dose was given every day for six days. A day was then missed, and during the next six days an increased dose given. Every seventh day was missed, and the dose gradually increased. Thus, dog No. 6 was experimented on for seventy-three days. During each of the first six days three centigrammes ($\frac{1}{2}$ grain) were given; during the next six, four centigrammes ($\frac{2}{3}$ grain). For ten days five centigrammes ($\frac{1}{3}$ grain) were given, for thirteen days six centigrammes ($\frac{9}{16}$ grain), for eleven days seven centigrammes, ($1\frac{1}{16}$ grains), and for the last eleven days eight centigrammes ($1\frac{1}{5}$ grains). The total quantity given was 3.35 grammes (52 grains). One day in the week was always missed. At the beginning the immediate effect of the cocaine was seen in increased frequency of the cardiac beats and of the respiration, which, however, did not last more than a quarter of an hour. Afterward great weakness of the legs came on, the animal remaining in a sitting posture and swaying its head to and fro. The pupils were dilated and sensation intact. In three hours the normal condition returned. When larger doses were given the disturbance was greater, the animal commencing to try to run about and the subsequent weakness lasting for a longer period. The general results obtained by observation of the animals during life and by post-mortem examination of the bodies showed that in acute poisoning the mode of death was asphyxia. In chronic cases without asphyxia there was a marked hyperæmic condition of the central nervous system, which presented a contrast

to the state of the rest of the organs, which were anæmic. Albuminoid degeneration was especially marked in the ganglionic cells of the spinal cord and the nerve-cells of the heart ganglia; it was present also, but in a less marked degree, in the muscular fibres of the heart, in the ganglionic cells of the medulla oblongata, and in the hepatic cells. In these last there was found an accumulation of glycogen. In chronic poisoning the degenerative processes were found to have advanced further in the cells of the spinal cord and medulla, minute cavities, atrophy, and hyaline degeneration being noted. In the heart there was fatty degeneration of the muscular tissue; in its nerve ganglia there were fatty degeneration, minute cavities, and simple atrophy; and in the liver atrophy of the hepatic cells was present. The vascular system was most affected in the spinal cord, there being cellular proliferation and hyaline degeneration of the coats. In the heart and liver an atrophic condition of the tissues was found, also a swelling of the endothelium of the capillaries of the cardiac ganglia.

Readers interested in the confessions of inebriates are referred to an account of the experiences of a French physician,⁷⁰ who became a cocaine habitué through the use of a spray for the relief of chronic naso-pharyngeal catarrh. He graphically describes his symptoms.

THE TOBACCO HABIT.

In an article on "Tobacco, its Use and Abuse," C. W. Lyman¹,_{Sept.} calls attention to the fact that there are five million two hundred and fifty thousand acres of land in the world given up to the cultivation of tobacco, and that the United States' internal revenue from tobacco has been more than forty millions of dollars per annum. An interesting discussion and investigation concerning Egyptian cigarettes has been carried on in the *Lancet* (August 25, September 29, October 13, 20, 27) due to certain statements made by a writer styling himself "Medicus," and others who supported his claims, charging that Egyptian differ from English and other foreign cigarettes in that (1) they contain opium or some other foreign and deleterious substance, "Medicus" asserting that he had found a large proportion of opium and an unclassified alkaloid; (2) that the paper used in their manufacture contains arsenic or copper or chlorine; (3) that the tobacco consists in

part of the Smyrna variety, known as "Solouk," or "Aya Solouk," which is coarser, stronger, and more irritating to the throat than genuine Turkish tobacco; (4) that in consequence of one or more of the above defects Egyptian cigarettes are apt to produce malignant throat diseases. The *Lancet* Analytical Sanitary Commission undertook the investigation of these charges. They purchased from London tradesmen cigarettes of five well-known brands, and submitted them to analysis. Under the microscope no trace of foreign leaf or foreign substance was detected in the tobacco. Chemical tests to detect extraneous alkaloids were made. The tobacco was exhausted with dilute acetic acid and the filtered extract treated with lead acetate; the resulting precipitate was decomposed by hydrogen sulphide and filtered. The concentrated filtrate gave no color with ferric chloride, showing the absence of meconic acid (it contained, of course, much malic acid). The liquid filtered from the lead precipitate was freed from lead by hydrogen sulphide and from nicotine by the ether method, and tested for morphine in the usual way. Not a trace was detected. In other experiments the nicotine was removed by distillation in a current of steam. No alkaloid remained. The cement was found by the iodine test to be starch in every case, and the paper was pure with the exception of a trace of copper found in the ash, probably due to metallic lettering. They conclude, however, that the presence of the Smyrna or Solouk tobacco in excessive quantities will affect the throats of some persons injuriously. Their Eastern correspondents have informed them that this "Aya Solouk" possesses a strong but by no means a delicate aroma, which prevents the detection of any inferior leaf, and is therefore used in blending tobaccos. Its strength and flavor is popular with some. It produces a tickling sensation in the throat. The natives where it is grown are able to tolerate it pure, according to Thomas Christy, who also states that the Malays can inhale the strongest tobacco; the cross-breeds between Chinese and Malays coming next, while in China a native selects the quality or strength of his tobacco according to the power of his throat to endure the sensation of smoke passing into the lungs without making him cough.

A Cairo correspondent ⁶_{Sept. 29} gives "a practical hint from a wise old Oriental who smokes seventy or eighty cigarettes a day."

Always use a cigarette-holder, and in the holder a tiny plug of cotton-wool previously dipped in lemon-juice and changed every time with the cigarette.

Dudley⁹_{Sept. 16} has made experiments seeking to explain "The Poisonous Effects of Cigarette Smoking." He states that besides combustion, destructive distillation takes place in the pipe, cigar, or cigarette as the result of heat and the exclusion of the oxygen of the air, which has been completely used up in passing through the red-hot burning tobacco, in front of that which the fire has not yet reached. The products of this destructive distillation are ammonia, a yellow and very poisonous substance of disagreeable odor called nicotianine, some nicotine, though most of the latter has been destroyed by heat, and many other products of minor importance. When there is a layer of fire one-sixty-fourth to one-sixteenth of an inch in thickness, as the air is drawn through it carbon dioxide is first formed; on passing through the hot carbon, this is reduced to carbon monoxide, and as such is drawn into the mouth, for where it passes beyond the fire there is no air or oxygen to convert it back to carbon dioxide. Its well-known poisonous effects when inhaled are the result of its affinity for the hemoglobin of the blood, converting the oxyhemoglobin into carbonic oxide hemoglobin, a stable compound, not reduced in the circulation; hence producing permanent asphyxia.

An animal was placed in a bell-jar and supplied by air aspirated through a system of tubes containing at one end a lighted cigarette, and at intermediate points bulbs inclosing a solution and fragments of potassium hydrate, to absorb the carbon dioxide and any acids or condensable bodies. On lighting the cigarette and aspirating slowly, the animals (mice) died, one in twenty-two minutes and another in twenty-four minutes. The spectroscope showed that all the oxyhemoglobin had been converted into carbon oxide hæmoglobin. In a third experiment the smoke was drawn directly into the jar without purification, and death resulted in six minutes, the rapid result being due, according to the author, to the more rapid aspiration of the smoke from lessened resistance in the tubes. The amount of tobacco consumed was about the same as in the former experiments, namely: one and one-fourth cigarettes, and the spectroscopic results were also the same. He concludes:—

1. That carbonic oxide is the most poisonous constituent of tobacco-smoke.

2. That more injury results from cigarette than from cigar or pipe smoking, because, as a rule, the smoke of the former is inhaled.

3. That cigarette smoking without inhaling is no more injurious than pipe or cigar smoking.

4. That the smoke of a cigar or pipe, or Turkish pipe, if inhaled, is as injurious as cigarette-smoke inhaled.

I regard it as unfortunate that these interesting experiments were not extended and varied to exclude several sources of error which suggest themselves.

Fassinari⁵⁰_[94.14, No. 15; Oct. 13] has studied the effects of tobacco-smoke on the growth of microbes, and finds that exposure of a bit of linen soaked in the culture fluid to tobacco-smoke for about half an hour retards the subsequent development in fluid gelatin for many hours, varying, with the kind of microbe and the variety of tobacco used, from seventy-two to one hundred and sixty-eight hours. He experimented upon spirillum cholerae Asiaticae, spirillum Finkler-Prior, bacillus anthracis, bacillus typho-abdominalis, bacillus pneumoniae (Friedländer), staphylococcus pyogenes aureus, bacillus prodigiosus. Further researches are promised.

Dumas¹¹²_{Nov. 15} doubts the efficacy of tobacco-smoke in arresting the development of the tubercle bacillus from his experience in the case of a young subject who smoked by inhalation almost continually, but finally developed phthisis, which improved after he ceased to smoke for a time, yet became worse on his resuming it, death finally resulting. The observer considered it a case of phthisis provoked by the abuse of tobacco smoking.

Sehtscherbak¹¹³_{Apr. 15} experimented upon animals by forcing them to inhale the smoke from a burning cigar, but permitting them to exhale freely. He found exalted faradic excitability of the motor centres and subjacent medullary substance. When the nicotine was removed from the tobacco-smoke by passing it through hydrochloric acid this was not observed. Subcutaneous injections of nicotine (0.50 gramme) also increased the faradic excitability. In two cases of acute tobacco poisoning in men he found, however, diminished excitability of the skin to painful impressions, of the tendon reflexes, the vision and hearing; all depressive effects.

Decaisne, ³_{Apr 18} in an experience of twenty-five years, has seen sixty-three cases of smokers' vertigo, the attacks being characterized by a sensation of emptiness, as if consciousness were about to be lost, failure in the effort to fix ideas, inco-ordination of movement, and deceptive sensory impressions, the body and everything around appearing to revolve when the eyes are closed. Of the sixty-three subjects, varying in age from twenty-nine to sixty-six years, forty-nine were from fifty to sixty years old. More than half the cases presented, besides the vertigo, digestive disturbances, alternating constipation and diarrhœa, dyspnœa, excessive urinary excretion, more or less abundant sweating, insomnia, and palpitation. A third showed intermittent pulse and angina granulosa. Some had emphysema, aphtha, amblyopia, and bloody expectoration. With thirty-seven who smoked before eating the vertigo almost always appeared in the morning. It ceased entirely in thirty-three of the thirty-seven patients when they were permitted to smoke only after eating. The onset of the vertigo in one-third of the cases commenced with the suppression of a profuse perspiration and marked diminution in the urinary excretion. The symptoms of smokers' vertigo have sometimes been confounded with cerebral congestion and also with cardiac disease. His treatment consists in the absolute withdrawal of tobacco, regulation of the habits, the use of laxatives, warm baths, magnesia, and the bitter tonics. Hypodermic injections of ether were given twenty-eight times with the effect of stopping the vertigo in six or seven minutes. Decaisne attributes the vertigo to marked contraction of the cerebral vessels, the effect of nicotine, which causes contraction of muscles in vessels, as proven, he claims, by numerous experiments. The symptoms of cerebral congestion observed he believes to be the result of vascular dilatation, a reaction from the state of contraction.

Cervey, ⁶⁷_{May 9}, on the other hand, finds smokers' vertigo confined to those who inhale tobacco-smoke, and ascribes the injurious effects to its action upon the pneumogastric while it is retained in the pharynx, larynx, and trachea, claiming that the cardiac, pulmonary, and digestive disturbances are mainly the result of enfeeblement in pneumogastric action.

Fussell ¹⁹_{Jan 20} reports nine cases of functional cardiac disorder due to chewing tobacco excessively, all in young men between seven-

teen and twenty-seven years of age. The habit was begun early in life in all the cases, and the amount of tobacco used ranged from half a pound to a pound a week. The symptoms were palpitation in nine cases, pain over the heart or under the sternum in seven cases, slight dyspnoea in three cases, irregular cardiac activity in only one case, hypertrophy in two cases. Other causes than tobacco were excluded. Total abstinence from tobacco, and in some the moderate use of potassium bromide, gave entire relief in three or four weeks.

Attention has been called ²²_{Oct. 31} to the possibility of evil effects resulting to infants in the limited apartments of the poor from tobacco-smoke. The symptoms are said to be loss of appetite, sunken eyes, listless ways, restless nights, nausea and vomiting, these phenomena disappearing on removal of the cause.

Decroix ³⁰³_{Dec 12/87} ⁹_{Jan. 14} has proposed hypnotic suggestion as a remedy for the tobacco habit, and Voisin has reported cases cured by this means after the failure of other remedies.

THE COFFEE HABIT.

Guelliot ²³⁴_{Mar.} reports his observations upon twenty-three cases of what he terms chronic *caffism*, characterized by anorexia, insomnia, tremor of the lips and tongue, gastralgia, and various forms of neuralgia, dyspepsia and leucorrhœa. The features become thin and pinched, the skin pale or grayish yellow and wrinkled, the pulse weak, frequent and compressible. Sleep is troubled by anxious dreams. Seventeen of the cases were females. The evil effects of coffee are especially observable in children.

THE TEA HABIT.

The annual amount of tea ⁶⁰_{Nov. 17} consumed in the world is said to be two billion five hundred million pounds, of which the United States takes about seventy million.

Brullard, ²¹¹_{July 1} ¹⁴⁷_{Oct.} from observations upon seventy-four cases of excessive tea drinking, concludes that the action of tea is cumulative, the effects being most pronounced upon young subjects, the debilitated and anæmic, though it may affect those with good constitutions. Toxic effects are not produced by less than about five cups a day. The symptoms are loss of appetite, dyspepsia, palpitation, nausea, vomiting, nervous excitement, disturbances of the

intellect and even maniacal attacks, cardiac pain radiating to the left arm and various parts of the chest.

DISEASES OF THE UTERUS, PERITONEUM, AND PELVIC CONNECTIVE TISSUE; DISORDERS OF MENSTRUATION.

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UTERINE DISPLACEMENTS.

General Considerations.—Davenport⁹⁹_{Aug. 23} calls attention to the systemic and nervous depreciation accompanying and in most cases caused by displacements, and to the necessity for vaginal examination when other efficient factors cannot be found for the symptoms. Murphy⁸⁹_{Aug.} also speaks of the necessity for combined local and systemic treatment, the building up of the general strength by tonics, by proper food, etc., as well as hot douches, depleting or astringent tamponade, and pessaries.

Helen Betts⁶¹_{Apr. 23} shows clearly and definitely the harm resulting to women from the usual mode of dress, where, in addition to the constriction of the waist by the corset, there is added that of the bands supporting the often heavy skirts and underwear. This constriction and weight interferes with the circulation in the pelvis and lower limbs, causing an habitual venous congestion, presses the contents of the pelvis downward, while the restriction to active movement caused by the clinging friction of the skirts about the calves and ankles effectually restrains any extended active muscular movement and development of the pelvic and thigh muscles. These factors, acting from the time of puberty or before, are responsible for many of the disabilities of women as manifested in uterine and ovarian congestions and displacements, weakened and easily torn perineal tissues, lessened powers of locomotion, and depreciation of the general health. Dress reform is most vitally necessary for the working classes. The most important feature, the removal of pressure and weight from the waist, is accomplished by wearing a long waist accurately fitted to the figure, to which are

buttoned the skirts by a distinct row of buttons for each. The waist-bands of the skirts are of the same length as the circumference of the waist, so as to avoid any constriction. Shoulder-straps for supporting the skirts will not take the place of the full waist, as by their use the weight is brought upon two small points and they become intolerable. This form of dress can be as neat and trim as where the corset and bands are used. Kellogg⁶¹_{Dec. 8} also shows the evils of modern dress and its powerful influence in producing displacements, and urges the necessity of systematic muscular development.

"A young woman who has failed to develop strong abdominal muscles, who has not been allowed to run, jump, and romp, and harden the muscles of the trunk and limbs when a girl, is a candidate for retroversion or flexion or ovarian prolapse, or some allied malady, as soon as she is obliged to endure any sort of physical hardship."

ANTEVERSIONS AND FLEXIONS.

Etiology.—Dolérís²⁴_{Jan. 15} and Martin²³_{June} hold that anteversions and flexions are only in rare instances congenital, that they are the result of previous parametritis, that they are not produced mechanically, and that the majority of the symptoms depend on appearances of irritation, especially of the uterine mucosa. Even that form of anteversion characterized by the presence of a long, conical cervix, small os, and backward displacement of the whole uterus, which is one of the most common accompaniments of sterility and which we have always held to be due to a congenital lack of development, is considered by Martin to be the result of chronic uterine catarrh. He considers that his opinion is corroborated by observations which he has repeatedly made where in women who have had one or more pregnancies the uterus, which had been normally shaped previously, had acquired this form under the influence of cervical catarrh. Putnam-Jacobi²⁷_{Mar.} agrees with the theory of displacements as the result of a parametritis, and considers the symptoms due to venous hyperemia and impaired nutrition, caused by the abnormal curves and flexions produced in the uterine arteries. Hewitt,²²_{Jan. to June} in a series of articles on the "Influence of Tissue Changes in Producing Uterine Flexions," summarizes his views as follows: Undue softness of the uterus associated with defective nutrition, either in nulliparous or in parous cases, usually precedes

flexion; flexion then occurs, often directly after some overstrain or fatigue; the flexed and soft uterus readily becomes congested and, in time, hypertrophied; the flexion, being permanent, is an obstacle to the removal of the congestion; compression of uterine tissue caused by flexion is an important element in chronic metritis; endometritis is, as a rule, a secondary effect of chronic general congestion of the uterus. Thomas²⁷_{Oct.} holds that irreducible anteversions are usually produced after about the tenth year of life by tight lacing or by an habitually distended rectum; they are the result of a long-continued pressure on an undeveloped uterus. Reducible anteversions are usually produced by pressure on a developed uterus, although the displacing force may be disease or traction from a false membrane. In the menstruating period of life anteversion of the uterus is a serious disease and the prognosis should be a cautious one. Atrophic and fatty changes in the tissues of the flexed uterus are frequent and prevent recovery. Halliday Croom²_{Feb. 11} regards antedisplacements in virgins as being generally congenital conditions, except when associated with diseased conditions of the annexa.

Diagnosis.—Small fibromata have been mistaken and treated for anteversion, as was done by Martineau in a case²⁴_{Apr. 29} reported by Triplet.

Treatment.—The indications are to relieve symptoms, to cure the pathological condition of the mucosa, to induce a return to the normal in the muscular tissue, and to restore the normal uterine position. These indications, according to Doléris,²⁴_{Jan. 15} are best accomplished by dilatation with carefully asepticized laminaria tents, to soften the tissues, and render intrauterine medication more easy and thorough. This dilatation is to be repeated at intervals, if necessary. The curette is to be thoroughly used over the diseased mucosa, and especially at the angles of flexion. In severe anteversions præcervical colporrhaphy may be necessary, the technique of the operation being as follows: After careful disinfection of the parts, the area of an equilateral triangle with sides of from one and three-quarters to two and a quarter inches, with its base at the cervix, is denuded, as in any plastic operation upon the vagina. Sutures are then passed through and across each corner of the triangle so that when tightened the wound takes the shape of a three-rayed star. Any opening remaining in the centre is closed

by a bag-mouth suture. This operation is intended to draw the cervix forward by shortening the anterior vaginal wall immediately in front of it. Should the cervix be much elongated it can, as recommended by Martin,²³_{June} be resected to a normal length. Doléris frequently executes all of these procedures at one sitting and reports most excellent results.

Noble,¹³⁷_{July 15} realizing that the flexion is much more easily reduced when the tissues are soft and pliable, after a preliminary course of hot douches and glycerine tampons employs the intra-uterine tamponade with antiseptic gauze or wool, small strips being passed into the cervical canal down to the point of flexion. These are increased from day to day until the cervix is well distended and thinned. Then a small part of the dressing is carried just beyond the angle and carefully increased at subsequent treatments until the uterus is somewhat straightened or until the cervix at the angle will collapse when the dressing is removed. The uterus is then straightened bimanually and held in position by a carefully fitted pessary or an intrauterine stem.

Halliday Croom,²_{Feb. 11} believes that dilatation with a bougie and the occasional passage of the sound, together with the persistent use of hot water, will usually effect a safe and efficient cure. Goodell,¹⁴_{July} advocates careful but thorough dilatation with the steel-branched dilator when dysmenorrhœa is a prominent symptom. Thomas,²⁷_{Oct.} uses a carefully adjusted pessary, and in severe cases an intrauterine glass stem, introduced after previous dilatation and supported by a lever pessary with a cup. Rigid antisepsis must be maintained and the stem left in place for from one to three months. He thinks the chances for subsequent conception better when divulsion is not employed. McGillicuddy,¹_{Aug. 11} prefers a dilator with blades opening antero-posteriorly, with which he dilates to the extent of half an inch and then introduces a stem. Electricity is also employed with success as a dilating agent. (See also Dysmenorrhœa.) Hewitt,²²_{Apr. 18} reports most favorable results from the use of his modified cradle pessary and believes that dilatation should always be followed by its use, if it is to produce a permanent cure. Martin,²³_{June} lays stress on the constitutional treatment, on the cure of the endometritis or local inflammations, and has only employed the intrauterine stem twice in the treatment of over ten thousand gynæcological cases seen during the last five years.

We have obtained the best results in the treatment of cases of antedisplacements with dysmenorrhœa and sterility by careful dilatation, to the extent of three-quarters of an inch, repeated if necessary, and followed, when there was flexion, by the introduction of a short, thick stem. The stem should be worn for three or four months, being removed just before the menses and replaced after the flow is over.

RETROVERSIONS AND FLEXIONS.

Etiology.—Much of what we have noted concerning the etiology of antedisplacement will apply to the forms now under consideration. Bond⁸²_{May 12} calls particular attention to the influence of parametritis and especially subinvolution of the uterus and its ligaments in producing posterior displacements, while Croom²_{Feb. 11} emphasizes the frequency of a mechanical origin. Berrut¹⁵⁴_{May 1; July 2} in reviewing the subject of posterior displacements, looks upon the unstable condition of the uterus as a proof that woman was intended for the attitude of a quadruped. Sexual intercourse, he says, was first practiced *more canino*, and “it is the projection, which has probably been progressive, of the vulvar cleft toward the front, which gives to man the privilege of intercourse face to face.”

Treatment.—While the various methods of treatment of the retroposed uterus by abdominal fixation have claimed the major share of attention in the literature of the year, the consideration of milder means has not been entirely neglected.

Skutsch, Fritsch, and Winckel²⁷_{Sept.} hold that while it is difficult to properly select and fit a retroversion pessary to each individual case, when skillfully employed it gives much better results than are generally reported. Of two hundred and thirty cases of retroflexion at Schultze's clinic no treatment was employed in twenty-five, other indications having to be met. Of the remaining two hundred and five cases satisfactory results were obtained in one hundred and eighty-two by pessaries. Hatherly²⁶_{June} urges more attention to general treatment by rest and tonics and less reliance on mechanical intervention; he reviews the indications for and against the use of pessaries.

Byford²³_{Apr.} has modified Miller's repositor so that it is now essentially an intrauterine stem with a thimble for the finger-tip

placed at right angles, instead of in the axis of the stem as before.

Where the uterus is held in its retroverted position by peritoneal *adhesions* these, of course, must be overcome before it can be replaced. Schultze³⁹³_{B1,14,11,1} has for several years, and in a large number of cases, broken down these adhesions bimanually, achieving often most brilliant results. He has never seen any harm result from the manipulation, no peritonitis, exudation, or appreciable hæmorrhage. He cautions against the use of a tearing force: "It is the careful stretching *in situ* of the adhesions, of which every detail has been already ascertained, and the reposition of the uterus thus made mobile, which is crowned with success." An extremely delicate sense of touch and much experience in dealing with such adhesions is very necessary to success, and no one has as yet achieved results which can be compared with those of the author of the method the technique of which is as follows: The patient is placed in the lithotomy position upon the edge of the operating table, the stomach, bowels, and bladder being thoroughly emptied. The index and middle fingers are introduced into the rectum, and any remaining fecal matter washed away by irrigation with warm water. This irrigation is of great advantage during the manipulations, as, by spreading out the folds of the mucosa, it permits the fingers to be passed more readily beyond the ampulla recti. The thumb of the same hand explores the vagina, while the other hand examines through the abdominal walls. After exact exploration of the uterus, tubes, and ovaries by the finger in the rectum, the body of the uterus, under control of the internal hand, is gently raised up. The adhesions are thus put upon the stretch, and if the fundus can be raised to the promontory of the sacrum it is caught by the hand acting externally through the abdominal walls and brought forward into its normal position. The extent, origin, and course of the adhesions are thus exactly ascertained, and upon this knowledge depends the treatment. Slight adhesions usually yield to the pressure of the fingers; more extensive ones are manipulated by the finger-tips very much in the same way as an adherent placenta is peeled off. The manipulations are practiced as much as possible upon the uterine ends of the adhesions, dragging upon their attachments to rectum or pelvis being avoided. When reposition is accomplished the uterus

is to be held forward by a suitable pessary. Nearly identical manœuvres are requisite for freeing adherent ovaries.

Ter-Grigorianz ⁷²⁴ ⁵ _{V.12 No 13, June} recommends the following method as being more convenient than Schultze's, since it can be practiced without an anæsthetic. The anterior lip of the cervix is seized with a volsella and drawn downward and forward, being held by an assistant. The examiner can then map out the entire posterior surface of the uterus as high as the fundus, can detect any adhesion, and can tear it if it is not too strong. The uterus may then be lifted on the finger, while the external hand is inserted behind the fundus, so as to draw it forward. If reposition cannot be accomplished in this manner, the cervix is drawn backward and downward, and held so while the operator pushes the fundus upward with the index finger, assisted by manipulation through the abdominal wall. It is sometimes possible to hook the fingertip over the cicatricial bands and to draw them downward and forward, so as to stretch or tear them. If this fails the uterus is lifted and pushed as far as possible to the right or left. Slight adhesions may be broken at one sitting. Stronger adhesions should not be torn at once, but stretched a little once or twice a week. With very extensive adhesions it is not practicable to treat by these extraperitoneal methods.

Alexander's Operation for Shortening the Round Ligaments.

—In Germany, where the tendency of the day is toward the larger plastic operations and to abdominal surgery, there is still a great deal of theoretical opposition to the performance of Alexander's operation (Sänger, ³¹⁷ _{Jan.14,21} Winckel ²⁷ _{Sept.}), but in America, England, and France nearly all those who have had practical experience with this procedure have now declared in its favor, and it will undoubtedly continue to be done successfully in properly selected cases and with accessory operations for lessening the weight of the uterus, narrowing the vaginal walls, or repairing the torn perineum. This combination of Alexander's, with other plastic operations upon the genitals, does not, in the opinion of the senior editor, ²⁷ _{Nov.} detract in the least from the value of the former, but merely shows that its scope is limited, and that it needs auxiliary measures to insure permanent success. Doléris ¹⁵⁴ _{May 1} and Kellogg ⁶¹ _{Dec.2} also lay stress on the necessity for the combination of operations, and think that much of the prejudice which exists against the method is

the result of the extravagant claims made for it by some of its early advocates. The senior editor of this department, who was the first to do the operation in this country, has recently reported twenty-three cases²⁷_{Nov.} with excellent results, and speaks strongly in its favor, while Kellogg⁶¹_{Dec.8} with sixty-five successes out of sixty-nine cases, is still more enthusiastic. Edwards⁷³_{June 2} in an extended review of the subject, also decides in its favor, while Nammack⁵⁹_{Mar.17} Lee,¹_{Mar.3} Strong,⁹⁰_{Feb.16} Chadwick,⁹⁹_{Mar.8} Roux,¹⁹⁷_{Nov.29} and Brown⁵⁹_{Mar.3} report good results from operations.

Coe¹_{Mar.17} calls attention to possible dangers which might follow upon forcible traction of diseased and adherent tubes, and to the liability of producing vesical irritation from pressure or traction on the vesical neck.

The fact that the round ligaments are usually found in a relaxed condition, having a slack of from one to two inches, has led to the supposition that they have little to do in maintaining the uterus in its normal position in the pelvis. Kellogg⁶¹_{Dec.8} has made a series of experiments to determine the electro-contraction of these ligaments, and has arrived at some interesting conclusions. He considers the round ligaments active as well as passive in their functions, and states that they contract actively, simultaneously with the abdominal muscles in such actions as coughing, straining, and lifting, so that the fundus is tilted forward at the moment the downward pressure is exerted, thus diverting its force toward the sacral hollow and behind the uterus. He has invariably found the round ligaments large and well developed in women who have from early life been accustomed to such active physical exercises as are calculated to produce a good physique and well-developed muscular system; while in women of long sedentary habit, or who from early life have had their bodily movements so restricted by tight corsets and dress as to prevent freedom of movement in the muscles of the lower part of the body, he has invariably found the ligaments slender and weak.

Indications.—The greatest value of the operation is in old cases of retroversion and flexion of the uterus, especially when associated with descensus or actual prolapse and with more or less anterior or posterior colpocoele; that is, when the pelvic floor is either injured or relaxed beyond non-operative restoration.

To these indications Kellogg adds cases of displacement accom-

panied by prolapse of the ovaries, so that the wearing of a pessary is painful or intolerable; or cases of enlarged, painful, and prolapsed ovaries when a source of reflex or local disturbance irrespective of the position of the uterus itself; and in extreme anteversion of the uterus when there is great bladder disturbance. In support of these indications he cites forty-two cases in which the ovaries were enlarged or prolapsed and in which after the operation they were so perfectly restored, save in two instances, that they could not be felt *per vaginam*. In the one case where he operated for vesical trouble caused by anteversion, the result was all that could be desired.

The presence of *adhesions* is to be held an absolute contra-indication except where they can be broken by gentle manipulation according to Schultze's method.

Technique of Operation.—A great objection to the operation, and one met with by many experienced gynaecological surgeons, has been the uncertainty of finding the ligaments. These failures, according to the senior editor of this department, were due to a too great attention to the *minute* details of the inventor, a too careful dissection down to and through the external ring, and a failure to correctly locate essential landmarks. The method he now employs is as follows:—

The pubic spine being accurately located, an oblique incision in the direction of the inguinal canal is made down to the spine, so as to almost nick the periosteum. The tip of the index finger immediately touches the spine, which remains the chief guide until the ligament is seized. Bleeding vessels are secured with catgut. The first deep incision has nicked the fibres of the inter-columnar fascia and through the slit protrudes a little knuckle of fat which should not be disturbed or lost sight of, as it indicates the location of the terminal fibres of the ligament. The pillars of the ring are laid bare by scraping with the handle of the scalpel, and the *whole mass* of fat and connective tissue lying in the ring is gently lifted up and an aneurism needle passed under it *close to the bone*. The attachment to the pubic spine is not severed. This mass being seized with forceps or the fingers, gentle traction is made, and the fibres are seen to extend between the pillars of the ring, to which they appear attached. This attachment is slight and is loosened by sweeping the scalpel handle or finger around

the cord, the firm, round contour and glistening sheen of which now, as gentle traction is made, show it plainly to be the round ligament.

Kellogg adopts a slightly different method, more closely following that suggested by Alexander. After exposing the external ring by a small incision, he nicks the upper part of the intercolumnar fascia. Then the opening in the fascia is made to gape by drawing it back with a strabismus hook in the left hand while one in the right is passed down on the outside of the grayish mass seen through the opening. This mass is pressed a little toward the centre of the body, while the hook is pushed down to the lower part of the canal and its point turned inward, easily securing a mass of tissue which, when brought out of the opening, will be recognized by its gray color and many blood-vessels as the structures containing the ligament. It is important that the wound be kept free from blood in order that the appearance and color of the ligament can be identified. An aneurism needle with ligature is now passed under the mass to guard against its slipping back and the ligament cleared from the surrounding tissue, care being taken not to sacrifice any of the fibres which lead toward the internal ring. Fibres are found which do not drag upon the borders of the ring, and by gently drawing on these the smooth, glistening cord of the ligament emerges.

Gentle, steady traction will usually bring the ligament out, but sometimes the force required is quite great. It is important to separate the ligament from the accompanying nerve, which is about the size of No. 9 silk, and which offers great resistance to traction.

The ligament having been found and loosened on one side, the wound is covered with a pad of antiseptic gauze and the operation repeated on the other side. Then the uterus, being anteverted by the sound, is held so until both ligaments have been drawn out equally from two to four inches, the fundus being held against the anterior abdominal wall. The ligaments are now stitched into the wound with silk-worm gut, which is carried on a slender, curved needle deep through skin, connective tissue, pillar of the ring, and ligament, and then out through the same tissue on the other side. Four to six sutures are usually required. A small, split-bone drainage tube may be put under the ligament before the sutures are

tied, the wound is dressed antiseptically and the patient kept in bed with elevated knees. The urine should be drawn every four hours, and all straining avoided. Horizontal position for four weeks. Stitches to be removed on fourteenth day. Should supuration occur, compression of the canal should be obtained by a flat weight of lead secured by a spica bandage. A Hodge pessary is inserted before sitting up and worn for six months.

General anaesthesia is employed by all but Kellogg, who has done sixteen cases with cocaine. His patients have complained of no pain, except a little when the ligaments are being drawn out. Other methods of securing the ligament and other forms of incision have been devised, but have been generally dropped by their originators.

Vaginal Suture of the Uterus.—Schücking³¹⁷_{Mar. 24} has devised a means for the radical cure of the retroflexed or prolapsed uterus, which, though very simple, appears to be theoretically extremely bad. Whether it will prove safe and successful in practice remains to be seen.

After thorough disinfection of the vagina and endometrium, and with bladder and bowels thoroughly emptied, the patient is placed in an exaggerated lithotomy position and the fundus brought forward with a sound, while the cervix is drawn strongly downward with a *museau* forceps. A strongly curved needle *cachée* (made after the principle of Bellocq's cannula), with a strong silk ligature threaded through its point, is now passed through the uterine canal to the fundus, which is pushed as far forward as possible, while at the same time the anterior vaginal fornix is pushed upward and backward to bring it in close apposition to the fundus uteri. The fundus is held rather to the right, while an assistant with a sound in the bladder holds it to the left. By gentle side to side movements the operator determines the point where the instrument is pressing against the fundus uteri and fornix, and the needle is protruded and pushed through into the vagina. The ligature is then seized, drawn a little forward, and cut off from the needle, which is withdrawn, leaving the suture passed through the anterior vaginal wall and uterine canal. The ends are then drawn taut and tied together, so that the uterus is held in an exaggerated ante-flexion. An iodoform bougie is placed in vagina and *bladder*, which latter does not seem to be harmed if slightly punctured(?).

Ice is placed on the abdomen for twenty-four hours and the thighs are flexed to reduce tension. An iodoform bougie is placed in the vagina every other day until the suture is removed on from the tenth to the fourteenth day. The author states that his operations (eighteen) have been successful, that the uterus is held in good position, and that the exaggerated ante flexion disappears after the suture is removed. No serious bladder or intestinal troubles have appeared.

Ventral Fixation after Laparotomy Hysterorrhaphy.—Sänger, ³¹⁷_{Jan. 14, 21} who, like many of the Germans, does not believe in Alexander's operation, states that a large proportion of cases of retrodeviation which cannot be benefited by pessaries or indirect methods of operation should be treated by laparotomy and ventral fixation. He classes the methods in which this has been carried out as follows: 1 to 5. Castration, single or double, with suture of one or both stumps or fundus uteri into the abdominal wound or to abdominal wall; Koeberlé, Hennig, Ols-hausen, Tait, Kelly, Czerny, Sänger, etc. 6. Stitching of the cornua uteri (lig., rotund., lata) to the anterior abdominal wound without castration, pure hysterorrhaphy, which he claims for himself.

The most important papers of the year upon the subject are those of Kelly, ⁵_{May} Sänger, ³¹⁷_{Jan. 14, 21} Klotz, ³¹⁷_{Jan. 1; Feb. 4} Leopold, ³¹⁷_{Mar. 17} Phillips, ⁶_{Oct. 29} and Lee. ⁸²_{Nov. 10}

We cannot accept the sweeping indications for the operation which are given by its enthusiastic supporters, who state that it should be done in all cases of retroposition or prolapse, where vaginal treatment does not give relief. We would restrict it to the more serious instances which cannot be relieved by Alexander's method, believing that to be far less dangerous, in the long run, than any procedure necessitating the opening of the abdominal cavity, while its results appear to be equally as good. Of course, having the abdominal cavity opened for any other operative reason would render the indication for hysterorrhaphy urgent were marked displacement present.

Technique of Operation.—First laparotomy, making the incision long enough to allow easy manipulation; then, the hysterorrhaphy of Kelly, where the uterus is movable and not heavy. "A single silk-worm gut suture should be passed through or around the round ligaments at the uterine insertion on either side, and through the peritoneal coat of the bladder at the point on which

the uterus naturally rests, and tied. If care is taken not to grasp the bladder too much from the sides, there need be no fear of tormina as the bladder fills. This simple suture is not any more likely to prove a source of irritation to the bladder than sutures so often passed after its rupture. The relation of the uterine and vesical surfaces thus affected is intimate, and exactly imitates the natural position of the uterus."

In cases of adhesion, (Kelly) after releasing all attachments which bind the uterus down and checking hæmorrhage, the intestines should be kept out of the way by means of one or more large, flat sponges, or, better still, a properly disinfected piece of cheese-cloth, when the uterus is to be brought up, and two or three sutures of silk-worm gut or silver wire passed one below the other through each round ligament near its uterine origin, and deeply into the tissues of the abdominal wall just above the symphysis pubis on either side of the incision, and at a distance from it about equal to half the breadth of the uterus. These sutures are left long and held in the grasp of forceps until all are passed, when they are to be tied. They will hold the uterus snugly against the abdominal wall.

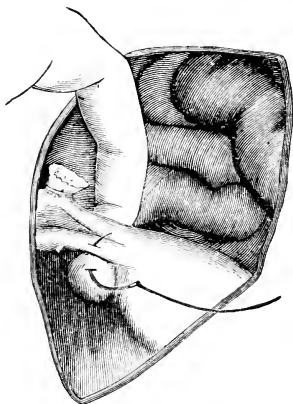


FIG. 1.—METHOD OF BRINGING THE ROUND LIGAMENTS INTO VIEW FOR THE PASSAGE OF THE SUSPENSORY SUTURE. (*American Journal of the Medical Sciences.*)

Leopold lightly scrapes the peritoneal surfaces included between the stitches, which he passes through the edges of the abdominal incision and lightly through the uterus, the first just below the attachment of the round ligaments and the second just anterior to the entrance of the Fallopian tubes, passing through about two centimetres of muscular tissue. The uterine stitches are removed the tenth day.

Klotz, after separating all adhesions and stitching tube or stump into the abdominal wound, passes a glass drainage tube behind the uterus. This seems inadvisable.

Wylie¹⁶¹_{July} shortens the round ligaments by passing three strong ligatures around a fold tight enough to hold it securely, but not to injure it. Union is assured by freshening the opposed surfaces and securing perfect apposition by several small stitches.

Results.—The mortality in the cases so far reported has been nothing and the results good. We believe that the indica-

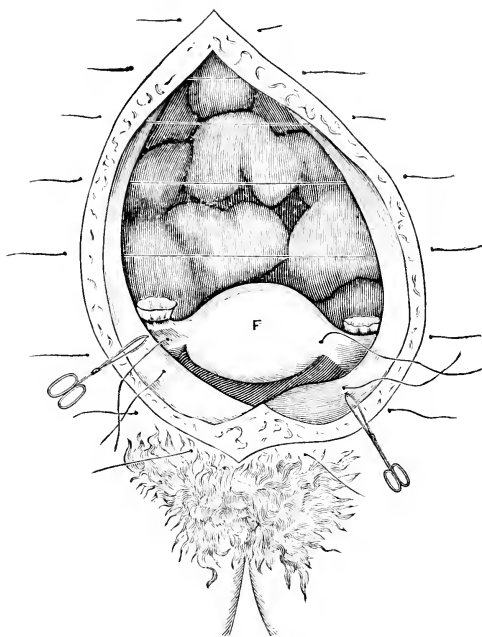


FIG. 2.

The fundus (*F*) in position before tying up the two suspensory sutures. The artery forceps are everting the peritoneum, through which each suture can be seen to pass.

(*American Journal of the Medical Sciences.*)

tions will be narrowed, and that in selected cases hysterorrhaphy will prove a serviceable and safe procedure. Time and clinical experience will show which method is to be preferred.

PROLAPSUS.

Trélat⁴⁸_{May} contributes an elaborate review of the whole subject of prolapsus, calling particular attention to the rôle of sudden effort

in producing the displacement. He also alludes to the influence of heredity. Tarrasch¹¹⁶⁸ lays more stress upon the constitutional laxity and weakness of the puerperal period as a predisposing factor, and Vallin²²⁰_{June 1} upon injury to the perineal floor and vaginal subinvolution.

Preuschen³¹⁷_{Mar. 31} reports favorable results in the treatment of prolapsus from methodical elevation of the uterus and exercise of the pelvic muscles after the manner of Brandt. The patient being in the lithotomy position, the operator presses his hands deeply between the symphysis and the fundus uteri, then grasps the uterus, drawing it up and letting it sink back for three times at each sitting, an assistant all the time keeping it anteverted by a finger in the vagina. The patient remaining in the same position, the thighs are abducted and adducted several times, the patient opposing as strongly as possible. Then percussion is made over the lumbar and sacral regions by a series of light taps with the edge of the open palm. The most important factors are the opposed movements of the hip, which strengthen and develop the muscles of the pelvic diaphragm.

Scott²²⁹_{Mar.} and Smith²⁷_{June} report good results from the persistent use of faradism, employing the current from a thick, short, wire coil, so as to get quantity rather than intensity, the latter, however, giving the most relief from conditions where pain is prominent.

Mundé²⁷_{Jan.} describes a case of acute, complete prolapse of uterus and vagina in a virgin, caused by heavy lifting. When first seen, the uterus was œdematous and irreducible. He applied a muslin bandage and constant irrigation with liq. plumbi et opii for twenty-four hours, then applied an elastic bandage, and after a few minutes was able to reduce the organ. He afterward, on account of descensus and pain, did Alexander's operation and colpoperineorrhaphy, with a resulting cure. He had seen one similar case of this rare occurrence.

Fränkel³¹⁷_{No. 18} in a note on Breisky's egg pessaries for prolapsus, cautions against leaving them in place for more than a few months at a time, as the rubber gets rough and so causes vaginitis. On account of the senile changes and atrophy after the climacteric the smallest possible size must be used, as otherwise great trouble will be experienced in removing them, necessitating, as in some of his cases, chloroform and incision of the perineum.

Cohn, ³⁹³_{Ed. 14, II. 2} in a study of the operative results of prolapsus uteri, states that colpoperineorrhaphy may permanently cure even extensive prolapse. Hegar's method answers all demands. Reasons for failure to secure permanent cure are, imperfect union, incompleteness of operation, subsequent severe parturitions, quick repetition of pregnancy. In order to obtain permanent results, it is desirable to perform the operation early; to narrow the vagina as much as possible throughout its entire length by high posterior colporrhaphy; to make as high a perineum as possible, bringing the vaginal entrance well forward.

INVERSION.

Fancourt Barnes ²²_{June 6} reports a case of complete inversion of four months' standing reduced by elastic pressure with Aveling's sigmoid reposer, and Edis reported a similar one reduced after eight years. Kempe ²_{July 7} succeeded in reducing a case of four months' standing by incision of the os and regulated constant pressure. Lee ²⁷_{June} notes two cases of complete inversion cured by persistent antiseptic, astringent tamponade after removal, in one case, of a small submucous fibroma, and in the other of a polypoid mass attached to the fundus, these having been the causes of the inversion. De Saint-Moulin, ²⁷⁶_{Nov. 5} in a case where the uterus could not be replaced, cured the patient by amputation with the *écraseur*. Mundé has met recently with a similar case where all attempts at reposition failed, continued elastic pressure, taxis, and Thomas' method (dilatation of the ring through an abdominal incision) all having been tried. He finally removed the ovaries and tubes and passed an elastic ligature about the cervix. The uterus came away in shreds by the thirteenth day, and the patient rapidly recovered.

LACERATION OF THE CERVIX.

The etiological importance of cervical lacerations in producing those manifold symptoms and conditions which we in America have attributed to them seems to be now as widely accepted as before Noeggerath's surprising conclusions ⁴₁₈₈₇ were published. These were, briefly, to the effect that "cervical tears have no influence on the development of uterine diseases; they increase the liability to conception, and diminish the chances of miscarriage," and that "Emmet's operation is never indicated and can have no

influence on the condition of the uterus." Such statements as these, coming from an obscure author, would have attracted little attention, but from one of Noeggerath's position they challenged criticism at once.

The junior editor of this department, after a careful research and study of four hundred consecutive cases, from the private case-book of the senior editor, Dr. Mundé, all of which had borne children, and one hundred of which had suffered no cervical laceration, the other even hundreds being torn respectively to the first, second, and third degrees, reached conclusions²⁷_{Mar.} agreeing closely with those of the profession in general: (1) cervical laceration does act as a predisposing or causative factor in the production of uterine disease, the frequency and severity of the consequent lesions increasing directly as the depth of the tear; (2) deep cervical tears do not increase but lessen somewhat the *productive* fertility of those in whom they have occurred. In regard to Noeggerath's last conclusion, that laceration and the operation for their closure will soon be stricken from the list of pathological affections of the uterus, he claims that "there are positive indications for restoring the torn cervix to its normal condition and form," which must be admitted by every candid and unprejudiced observer. A plastic operation is, by a cardinal rule of surgery, always to be preferred when equally effective to one of mutilation. Emmet's operation restores the parts as nearly as human skill can to their ante-partum condition, and, save in exceptional cases, is to be preferred to amputation, as advised by Noeggerath and other German authorities. Undoubtedly the importance of cervical laceration as a factor in the causation of uterine and systematic disease has been exaggerated; yet there remains a substantial basis of proven facts and indubitable clinical evidence to show that the profession have not erred in considering the condition one of considerable pathological significance and the operation for its relief logical and beneficent.

Sänger³¹⁷_{July} criticises Noeggerath's statements, and gives conclusions practically identical with those above. Noeggerath, in reply,⁴_{Oct.} recedes somewhat from his first position by stating that he did not say that the operation would not cure the conditions named, but that the tear did not cause them. He has never done the operation, because he thinks it unjustifiable, and would treat

the condition by caustics, etc. Denebitz,¹³⁵ Jan. while agreeing in certain points with Noeggerath, thinks his conclusions too hasty and not well proved. Houzel,⁴⁸ Oct., Nov. gives a good *résumé* of the subject pro and con, stating that "while slight tears can be cured by local medical treatment, the operation is so beneficial and so safe that we are not justified in depriving a patient, rendered an invalid by a deep tear, of its benefit." More-Madden,²⁶ Feb. Alloway,²⁸² Nov. with Nagel, Stoerck, Park, Sloan, Oliphant, Turner, Nairne, and others, who took part in a discussion before the Glasgow Obstetrical and Gynaecological Society,³⁶ June believe in the pathological importance of the lesion, and that trachelorrhaphy is the best treatment except where, with extensive laceration, there is much hyperplasia and ectropion, when resection gives the best results. Yarnall,⁸² June agrees with Noeggerath that general and local hygienic measures, together with time and rest, will cure the laceration in nearly every instance. The consensus of authoritative opinion in the United States is, as elsewhere, against Noeggerath's conclusions.

Concerning the operation itself, there are differences of opinion regarding matters of technique. Of operative modifications, that one is best which in the individual case will most nearly restore the normal form and condition of the cervix. Where the laceration is stellate or with much hypertrophy, it may be necessary to remove so much tissue that the procedure is practically an amputation; in other cases the denudation of the typical Emmet's operation will be better. Each case must be treated according to its own conditions. Cushing,²³ July in cases where it is necessary or more convenient to denude the entire surface, introduces a perforated rubber drainage tube, two and a half inches long, into the canal, fastening it to the cervix with a suture and approximating the denuded lips so as to close the wound about the tube. Sutures and tube are removed in from eight to fifteen days. We have used a glass or hard-rubber plug in similar cases with good results.

Herrick,⁵⁹ v.1, p.573 claims that, as little force is necessary to hold the lips together after they have been properly freshened, sutures are not required, and he uses, instead, an elastic band shaped like the cervix and large enough to cover the whole os and neck, with the exception of a hole in the end for secretions to pass through. This band is slipped over the cervix while the freshened edges are held together by a tenaculum forceps, over which it is first

passed. The advantages claimed for this method are: so little pain that no anaesthetic is required; no assistants needed; perfect apposition of wound surfaces and quick union; less danger of inflammation; no stitches to remove; in slight cases patients are not obliged to go to bed or to know that they are operated upon. It is difficult to throw the band around the cervix and to get a band to fit every case. Another method which Herrick recommends is to take a strip of block tin about one-sixteenth of an inch thick, long enough to reach around the cervix, and wide enough to cover the cervix from vaginal juncture to os. Three to six holes are punched through each end, through which silver wires are passed and twisted until the cervix is grasped sufficiently to hold the edges firmly together. Herrick claims that this proceeding is easily accomplished and perfectly efficient. We have never tried these methods, the advantages of which seem very problematical.



FIG. 3.—JENKS' NEEDLE.
(*Medical Age*.)

The operator must choose for himself whether he will employ in the operation the knife or any of the numerous patterns of scissors advocated. Personally, we prefer a strong, sharp-pointed, double-curved scissors. Silver wire, silk-worm gut, silk, or prepared catgut may be employed for sutures, according to individual preference.

Jenks,²⁰²_{July 10} has devised a needle for use in this and similar operations which is a cross between a Peaslee and a Hagedorn needle, and which possesses the advantages of strength, ease of passage through the tissues, certainty in putting the suture just where it is wanted, minimum amount of injury to the tissues. The needle-cuts being at right angles to the denudation and in the line of traction of the sutures, there is no gaping of the stitch-holes.

We have for some time used the Schnetter needle, which is curved, spear-pointed, with antero-posterior cutting edges, and which we have had made with a squared shank to prevent its turning in the needle-holder.

An ingenious instrument devised by Spear,²⁷_{May} which combines needle, needle-holder, and counter-pressure hook in one, consists of three bars operated by scissor-handles. The needle-bar carries at a right angle to its distal extremity a needle with an open eye at the point; the counter-pressure bar, having a slot near the extremity, serves to locate the point of exit of the needle, makes the necessary counter-pressure, and holds the suture beyond the slot ready to be drawn against the needle at the proper time. The middle or clearance bar is automatic in action and clears the needle by simply separating the handles. The lips of the cervix being approximated, the needle is placed on the anterior flap at the point where it is desired to enter, the fenestra in the counter-pressure bar at the point where it should emerge. By approximating the handles the needle is passed, and on separating them the needle is cleared and the suture drawn through the tissues.

Goodell¹¹⁹_{Apr.} calls attention to the necessity of preparatory treatment before operation and, in addition to the usual glycerine tampons, hot douches, and applications of tincture of iodine, carbolic acid, or silver nitrate ordinarily employed to bring about a healthier condition of the surface, advises, "cross-latching" with a lancet of any engorged nabothian follicles and their destruction with the silver stick and iodine.

Lee and Hunter²⁷_{May & June} each report a case of death from septic peritonitis following trachelorrhaphy. In each case the sutures were at once removed and the wound carefully irrigated. All the usual precautions were observed at the operations. Autopsy showed that the septic process had in each case extended through the tubes to the peritoneum.

Hardon²⁷_{Oct.} calls attention, in a carefully prepared paper, to a rare condition, superinvolution of the uterus following trachelorrhaphy, and reports nine cases, to which Hawkins¹⁵⁵_{Dec.} adds two. Hardon explains the occurrence as follows: If, by artificial means, the hyperæmia which forms a distinguishing feature of the first stage of subinvolution be made to disappear, the resulting condition may be the same as when the second stage is reached in the uninterrupted course of the disease. It has been shown that in subinvolution from laceration this hyperæmia is perpetuated by the mechanical injury to the uterus and the downward displacement of that organ. Clinical experience has demonstrated that when this injury is

repaired the hyperæmia disappears and the uterus gradually returns to its normal condition. This is the usual result of trachelorrhaphy. If previous to the operation the connective-tissue proliferation has progressed to such a degree that nature is unable to accomplish a *restitutio ad integrum*, after the exciting cause is removed, the operation will not have cured the subinvolution, but by removing the hyperæmia will simply have precipitated the final stage of the disease, the stage of sclerosis or superinvolution. Of the eleven cases; in eight which were treated by intrauterine faradization the menses returned, while in three which had no treatment the menses did not return.

SYPHILITIC GUMMA OF THE CERVIX.

Several cases have been noted by Rode³⁷¹_{v. 20, No. 2} (report of Dr. Eklund, corresponding editor, Stockholm, Sweden) in which the chief interest lies in their liability to be mistaken for malignant disease, they presenting the features of pain, offensive, profuse discharge, with the presence of a rapidly progressing excavated ulceration. There is, however, an absence of the hard induration of cancer, and they improve rapidly under general and local anti-syphilitic treatment.

ENDOMETRITIS.

Smyly²_{Feb. 11} enters a powerful plea for the use of the curette and microscope in the diagnosis and treatment of diseased conditions of the endometrium. Accuracy in diagnosis often insures success in treatment, and a beginning malignant growth may often be cured by complete removal, which a little delay would render impossible. In the majority of instances a fairly correct diagnosis may be made without resort to the microscope, but not always. For instance, when the dull curette brings away from a soft, velvety, but irregular surface strips of hyperplastic membrane, we might probably be correct in supposing the case to be one of fungous (hyperplastic) endometritis, yet, so far as the macroscopic appearances go, it might be a malignant adenoma or portions of a retained decidua. Even the whitish particles so strongly suggestive of cancer cannot be surely recognized without microscopic aid, and even with it, at times, it is no easy matter to forecast the probable malignancy.

Cornil and Brault,⁷_{Feb.} in a note on the lesions of chronic

endometritis, hold that the diagnosis can always be made between benign and malignant endometrial lesions.

Dolérís,¹⁵²_{Apr. 19} in describing the pathogeny of endometritis, considers that it may be due to exterior causes, represented by certain pathogenic organisms, to traumatism, or to internal constitutional causes. He holds that endometritis is necessarily the starting point of every parenchymatous inflammation of the uterus or periuterine tissues, and that when lesions of these tissues disappear, chronic endometritis usually remains.

Verchère¹⁵²_{Mar. 31} holds that all forms of endometritis are infectious and that they take their origin from a point of infection from some pathogenic organism introduced into the vagina or uterus. His views are, in a measure, supported by the researches of Winter,²⁹³_{7No. 2} who has determined that, while micro-organisms are always found in the vaginal and cervical canal, they do not exist above the internal os except with a diseased mucosa. These facts emphasize the necessity for careful disinfection of the vagina and cervical canal before any manipulations affecting the corporeal mucosa.

Ashby⁸⁹_{Feb.} records two cases of *syphilitic endometritis*, the disease affecting the placental site after abortions and manifesting itself by profuse hæmorrhages and a continued proliferation of granular tissue. This returned so quickly after repeated thorough curettings and cauterizations that it resembled a malignant growth. The disease was many times more severe than the ordinary forms of fungous endometritis which so often follow abortions. The junior editor has seen one similar case in a syphilitic nullipara of twenty, where violent hæmorrhages would come on without warning. Often the patient would awake from sleep and find herself in a pool of blood. Thorough curetting would bring away large quantities of gelatinous vegetations, and with the aid of an intra-uterine tampon saturated with iodine or liq. ferri persulph. would stop the bleeding for a few days, when another hæmorrhage would necessitate the same procedure. The patient improved under anti-syphilitic treatment, and after some eight or nine repetitions of the curetting in as many weeks the hæmorrhages ceased.

Treatment.—Chéron²²⁰_{Mar. 16} lays great stress on the necessity for combined local and systemic treatment in chronic endometritis. To combat constitutional dyscrasie he employs, in the strumous, sulphurate of calcium, iodine and the iodides, iodide of iron, and

cod-liver oil; in the arthritic, sodium bicarbonate or lithium salicylate; in the herpetic, sodium arseniate. The bowels must be kept regular by laxatives, avoiding the drastic purgatives; he recommends a powder of rhei, seven and a half grains (0.5 gramme), and acetate of potassium, one and a half grain (0.1 gramme), taken three times a day before meals when there is plethora, with profuse menstruation. Where there is an arthritic tendency the rhubarb is contra-indicated and in its place he employs the following:—

R Sulphuris sublimatæ et magnesii ustæ, āā gr. 10 (0.65 gramme).
Potassii et sodii tart., gr. 20 (1.3 grammes).

When ordinary means fail he recommends for an appetizer 0.4 grain (0.025 gramme) of picric acid dissolved in a quart of water, of which a claretglassful is to be taken before each meal. For the relief of nausea he uses a modification of the well-known "Imperial Mixture," containing a small dose of potassium bromide. For general nervous symptoms:—

R Tr. valerianæ, ʒ 1 (3.89 grammes).
Spirituſ mellissæ, ʒ 1½ (5.83 grammes).
Aquæ menth. pip., ʒ 5 (19.4 grammes).
Syr. ætheris, ʒ 4 (15.55 grammes).
Aquæ destillatæ, ʒ 12 (46.65 grammes).

M. Sig : Three to four tablespoonfuls during the day.

Much importance is given to spinal treatment by revulsives to the lumbo-sacral regions. Locally hot vaginal douches and glycerine tampons are employed. Scarification of the cervix is also recommended.

Chéron⁶¹_{Apr. 28} is said to have achieved most marvelous results in hæmorrhage depending upon chronic endometritis with chronic peritonitis, by the hypodermic use of a solution containing one and a half drachms (5.83 grammes) each of crystallized phosphate and sulphate of soda dissolved in four ounces (124.4 grammes) of distilled water. From one to one and a half drachms (3.89 to 5.83 grammes) of this solution is to be injected into the buttock or thigh twice a week. The solution must be made fresh and filtered each time. By this treatment the first case was *entirely* cured after six injections, and in twelve other similar cases equally rapid and permanent cure was obtained. Chéron does not attempt to explain the *rationale* of the method. Hubert¹⁰⁸_{July} also considers rest in bed, regulated diet, and general hygienic treatment of the first importance, but in addition he strongly advises residence at

some thermal station—at Vichy, when there is dyspepsia; Marienbad or Kissingen, when obesity is a factor; Kreutznach, for scrofulous tendencies; Aix-la-Chapelle, Mont d'Or, St. Etienne, for herpetic difficulties; Spa, Schwalbach, Pyrmont, for anæmia and chlorosis. Locally, he employs mercurial ointment, irritants, revulsives, or Priestnitz compress over the abdomen, uterine massage, hot vaginal douches. In some cases he would use caustics or the curette. Jouin²⁴_{Jan. 15} advocates the employment of medicated intrauterine bacilli of iodoform, resorcine, belladonna, opium, quinine, etc. Florian³_{May 30} finds that a tincture of the white nettle (*Urtica dioica*), gathered at the time of flowering, possesses remarkable hæmostatic properties when applied locally on cotton to the seat of any hæmorrhage.

Bröse,³⁹³_{H. 1} Fränkel³¹⁷_{Sept. 15} and Dumontpallier⁵⁵_{Aug. 4} confirm the favorable opinion of Rheinstädter³¹⁷_{Mar. 24} concerning the good results obtained in endometritis by intrauterine cauterization with zinc chloride, which he has practiced upon nine hundred and seventy cases during the last ten years. He applies the zinc about twice a week, and six weeks is entirely sufficient time in which to bring about a cure. He has never seen the cauterization followed by any inflammatory sequence or by stenosis. Ergot, hot-water douches, the glycerine tampon, and the zinc cauterization will in three months reduce the largest and hardest uterus to a normal condition, both as to size and secretion. The deepest erosions are healed over quickly. To make the application, the size and direction of the uterine canal is first obtained, and then a hard-rubber, or aluminium, cotton-wrapped applicator is dipped into the solution and passed through a speculum to the fundus, gently pressed in various directions, and after a moment withdrawn. The applicator must be passed rapidly to the fundus, for the uterus contracts quickly from the effects of the chemical irritation, and should this contraction occur before the internal os is passed the effort to reach the fundus will usually be futile. Any of the fluid which may come in contact with the vagina must be neutralized at once with soda bicarbonate to prevent its caustic effect. After the cauterization there may be some uterine colic. Bröse cautions against employing the treatment while there are any fresh inflammatory processes in the region of the uterus. Fränkel considers the treatment particularly valuable in gonorrhœal disease of the endometrium.

Pajot⁴⁸ June favors the use of caustics, grading the power of the agent used according to the nature or severity of the disease.

Steavenson⁶ June 23 calls attention to the value of electrolysis as the most efficient and elegant way of applying caustic. It can be most accurately localized at the part it is wished to affect; the extent of tissue to be destroyed can be regulated to a nicety, and its action can be commenced and arrested at any moment at the will of the operator.

Turning now to the more strictly surgical treatment, we find the more progressive French gynæcologists enthusiastically in favor of means which have been for a long time and extensively employed here.

Boreau,¹⁶² Feb. 25 after an elaborate review of the whole subject, concludes that intrauterine therapeutics realize the most logical and rational means of treating lesions of the uterine mucosa. Effective measures must be radical, and we must employ an agent capable of removing every vestige of the morbid tissue. Experience has shown that an incomplete destruction of the mucosa is very liable to be followed by an early recurrence of the disease. The curette is shown by large experience to be much safer and more certain in action than caustics. Smyly² Feb. 11 says: "Why should we spend months in making applications to a membrane which may be removed in a few minutes, with a certainty of its being speedily replaced by at least as good but probably a better one?" That the new membrane may be diseased is true, but this objection will apply to every form of treatment. Speaking generally, we may say that the success which has attended any therapeutic agent has been in direct proportion to its power of destroying the diseased membrane. Curetting is certainly more scientific and less barbarous than the use of caustics.

Most brilliant results after curetting, particularly in the hæmorrhagic forms of endometritis, have been reported by Cushing²³ Nov., Lumpe,⁸ Nov. 22, Monod,⁷⁰ Nov. 25, Boreau,¹⁶² June 25, Smyly,² Feb. 11, Brandt (report of Dr. Eklund, corresponding editor, Stockholm, Sweden), Doléris, and others. A caution on which all insist is that the operation shall be done with *strict antiseptic precautions* if we wish to avoid all danger. The procedure is contra-indicated (see also "Inflammations") by para- or peri-metritis, and, according to Brandt (report of Eklund, corresponding editor), by *acute urethritis*.

Delafosse¹⁵⁴_{Jan. 15} believes that the curette is often used unnecessarily. Piogly and Nitel also warn against the "too great vulgarization of a method reputed perfectly inoffensive," and would have the lines of indication drawn more sharply. Reeves Jackson²³_{Apr.} notes four cases where death has occurred from septic peritonitis after curetting. Two cases occurred in his own practice, though all usual antisepsis was observed, one in Nilsen's,²⁷_{p. 276, '96} and one in Goodell's,⁶¹_{Mar. 13, '96} the sepsis in the latter case being attributed to the use of a sponge tent.

Geyl⁹⁵_{ii. 3} calls attention to the occasional occurrence of temporary uterine paralysis during the operation of curetting under chloroform narcosis, as manifested by the sudden enlargement and flaccidity of the uterus, which might lead one to think that he had perforated the uterine wall and was moving the curette freely in the peritoneal cavity, were it not for the absence of shock, as manifested by the normal pulse, respiration, and appearance of the patient.

Intrauterine treatment by means of a brush (*écouvillon, écouvillonnage*) is strongly advocated by Doléris.⁵⁵_{Mar. 4} The brush is cylindrical, something like a small flue-cleaner, with thickly set, soft hairs. This is rendered aseptic by immersion in a one to one thousand sublimate solution and is then dipped in "antiseptic glycerole," composed of equal parts of creasote, iodoform, and turpentine, with enough glycerine to make it of a syrupy consistency, so that it is easily held between the hairs. The vagina being aseptic and the uterus previously dilated, the cervix is held by a tenaculum, and the brush introduced by a spiral movement to the fundus and then withdrawn in the same manner. It is best used with a solution to cleanse the mucosa and then to medicate, any medicinal agent used being made into a syrupy mixture or solution with glycerine. To obtain the effects of a mild curetting (*grattage, scraping*) it is necessary to have the hairs of the brush much stiffer and more thickly placed. It is used in the same manner, after dilatation of the uterus and careful asepsis, as before, but with a more rapid spiral movement. This removes superficial particles of the mucosa and soft and small granulations. After *grattage*, it is well to irrigate the uterine cavity with a hot, weak, antiseptic solution, and to apply a vaginal tampon with iodoformed glycerine. *Grattage* gives but little pain, so that no anæsthesia is necessary,

and it is followed by no unpleasant results. Where a more destructive effect is necessary the curette must be used and may with advantage be followed by the brush to remove all shreds and clots and to apply medicinal agents. There is but little hæmorrhage during the operation, and none after. There is a light-brownish flow for a few days caused by the deliquescence of the deeper cells of the mucosa, which, however, are very rapidly reproduced. Rest, quiet, and *antiseptic precautions* are the necessary after-details.

Chrobak³¹⁷_{Jan. 7} recommends the use of iodoformized wicking as a uterine plug in the treatment of endometritis. He passes a piece of from four to six threads of the wick into the uterus and lets it stay until it falls out, or from four to six days. He thus secures an application and good drainage at the same time. To introduce the wick he uses a pair of long, thin, smooth forceps, with the distal end made conical and the edges a little bent. Polk²⁷_{Sept.} considers drainage by iodoform gauze especially valuable in hæmorrhagic forms of endometritis. His method is to anæsthetize the patient, dilate the cervix and cavity of the uterus, irrigate with double catheter, pack lightly with strips of iodoform gauze; remove these in twenty-four hours, irrigate, and repack. Curetting is sometimes necessary, but drainage by the gauze is usually sufficient.

Moseley¹⁰⁴_{June 16} in purulent endometritis, employs the prolonged, hot, intrauterine douche, using a small, double-current catheter, and having the cervix well dilated. Six to eight quarts of water, plain or medicated, at a temperature of from 100° to 110° F. (37.8 to 43.3° C.), and from one to three washings are usually required to effect a cure. The washing must be *thorough* to produce the best results.

We have obtained the best results in the treatment of endometritis of mild grades by the use of a 50 per cent. zinc chloride solution, repeated at intervals of two weeks, if necessary. In hæmorrhagic cases the thorough, careful use of the sharp curette gives the best results, the curetting being followed by an application of equal parts of iodine and carbolic acid.

FIBROIDS.

General Considerations.—From a study of fibroids of the abdominal wall and from his experience in their treatment, Reed²⁷_{Oct.}

has reached these conclusions: Fibroids of the abdominal wall, however small or indolent, are very liable to take on active growth; when small, their integumentary relations are unimportant and their extirpation can be accomplished without serious danger to the patient, and should be advised; when large, their integumentary relations become very important, and their extirpation is hazardous; in case of a large tumor there should be no hesitancy in abandoning an operation when exploratory incision has shown it to be dangerous; in deep-seated tumors with extensive peritoneal attachments, electro-puncture should be tried before extirpation is undertaken. Ill²⁷_{Oct} has collected twelve cases of this form of tumor occurring in the United States. Ten of these occurred in females between the ages of twenty-three and forty-one years. In five of these cases the origin of the tumor was given as the fascia transversalis. In six cases the tumor was so closely adherent to the peritoneum that it became necessary to open the peritoneal cavity in removing them. In two of these excision of a large portion of the peritoneum became a necessity. Prokofieva⁵⁸⁶_{No.9} describes a case where a rather soft, subperitoneal, pediculated uterine myoma, size of a six months' foetal head, which had been so tender as to give rise to the supposition of a localized peritonitis, was successfully removed (by Ott) by laparotomy at the Helena Paulovna Hospital, St. Petersburg. On that part of the tumor which had been particularly painful on pressure was a round patch the size of a small cup. Its surface was raised a little above that of the rest of the growth. It was paler at the centre than at the circumference, and was separated from the surrounding tissue by a bluish-red zone of blood-vessels, which could be distinguished by the naked eye. Microscopical examination proved it to be a hæmorrhagic infarct, probably of embolic origin, as the patient was suffering from mitral disease. The case is believed to be unique.

Ménière¹⁵¹_{Apr.1} describes as *fibromitis* an acute inflammation occurring in fibroids that he considers to be a distinct and well-defined pathological entity, differing from any of the degenerative conditions previously described. The affection, which he describes entirely from clinical observation, is essentially an interstitial inflammation of the fibroid, which may end either in resolution or suppuration. Most commonly met with near the period of the

menopause, it is also found in young women, and the exciting causes are external violence, exposure to cold, exhausting physical labors. The marital relation is believed to have no causative influence. The symptoms are a sudden and progressive increase in the volume of the tumor, accompanied by very severe local pain and tenderness, general malaise, nausea, vomiting, often an initial chill, and more or less fever. The enlargement of the tumor is rapid and great, so that in six or eight days it may reach to the epigastrium. Diagnosis may be difficult if the previous condition of the case be not known. The pains may be paroxysmal and so simulate those of other affections, as hepatic or renal colic. In the mildest cases the disease may not pass beyond the stage of congestion, and the symptoms then disappear in two or three days. In other instances, particularly when near the menstrual period, the disease is much more serious and may go on with all the symptoms of severe pelvic peritonitis. Here again the disease may begin to amend, or erratic chills, profuse sweats, high fever, diarrhœa, and exaggeration of all the symptoms show the presence of suppuration. Abscesses form in the tumors or in the pelvic tissue about the uterus and pelvis, and may penetrate in any direction. Convalescence is long and tedious, lasting six or eight months. Rarely the affection may become chronic. Fibromitis is apt to be confounded with peritonitis, pelvic or general, with pelvic abscess, with hæmatocele, with hepatic or nephritic colic. The prognosis is usually favorable. Congestive fibromitis is more painful than dangerous, though death may exceptionally occur in the suppurative form. The disease is very apt to recur, especially among the working classes and those who cannot take proper care of themselves. Treatment is similar to that of other pelvic inflammations.

Treatment of Fibroids (Medical).—By a judicious and timely combination of various therapeutic agents, Bedford Brown⁴⁰_{Dec.} believes that the great majority of cases of uterine fibroid may be shorn of their worst features, that all may be benefited, and many cured. He thinks there can be no question that the character of the food exerts an influence over the growth of these tumors. Fatty and amylaceous material must be avoided. For the control of hæmorrhage he has found the so-called normal liquid ergot an excellent preparation for internal or hypodermic use, and regards it as particularly well adapted to the latter. It is very unirritating, and acts

with great promptitude. He believes that the continuous internal use of this article in twenty- or thirty- drop doses three times daily will accomplish more in the end than the hypodermic method. With this may be alternated a pill after the following formula:—

R Ergotini, 52 (7.78 grammes).
 Strychninae, gr. 1 (0.065 gramme).
 Quininae salicylat., 5 1½ (5.83 grammes).
 Acidi arseniosi, gr. 1 (0.065 gramme).
 Fiat pil. no. xxx.

One of these should be taken three times a day in connection with the following combination:—

R Fld. ext. hydrastis canad., 5 ½ (15.55 grammes).
 Aquæ cinnam., 5 5 (155.5 grammes).
 Fld. ext. phytolaccae, decand., 5 ½ (15.55 grammes).
 Sodæ bicarb., 5 2 (7.78 grammes).—M.

Sig. : Tablespoonful three times a day.

The most remarkable results, however, were produced by the regular and *persevering* use of the syrup of the lactophosphate of lime and the syrup of the hypophosphites, administered in teaspoonful doses each three times a day continuously for months, and with slight intervals, so as to give rest to the stomach, for years, that there might be maintained on the system a permanent influence.

The character of the six cases subjected to this treatment was of the most aggravated form, and they had previously been treated by means of ergot internally and hypodermically, the bromides, etc., without in any way retarding their progress. Five were so decidedly improved as to need no further treatment. These results are surprising and the method certainly merits further trial.

For suppressing hæmorrhage in cases of fibroma, Schmidt,⁶
 Fuchs,⁸⁰ Rutherfordord,² Terrillon,⁴⁸ Parsons,⁴⁹ and Lutaud²⁶
Dec. '87 July '21 May Aug. Sept.
 strongly recommend hydrastis canadensis as a reliable drug, using either the tincture in doses of from fifteen minims to one drachm (one to four grammes), or the fluid extract in doses up to half a drachm (two grammes). It causes none of the disagreeable effects of ergot, but has, besides its vaso-constrictor properties, those of a general tonic. Leonard²²⁷ and Jaurès¹⁶⁹
July Apr. advise the persistent and constant use of ergot. Ergot in our experience is an uncertain remedy, except in submucous growths.

Electrical.—The probable changes which take place from the

electrolysis of living tissue have been discussed in a highly scientific manner by Steavenson,²_{May 12} who states that it is difficult, in the present state of our knowledge, to say how many secondary electrolyses take place in the passage of the current through the body. That it meets several elements presenting different states of polarity toward each other is certain, but whether chemical change takes place at the points of junction of each of these heterogeneous bodies it is at present impossible to determine. As a rule, electrolysis does take place between any two substances of different electrochemical polarity at the point where they touch one another, if they are capable of conducting electricity. If in the treatment of a uterine fibroid we use an external potters' clay electrode, a water rheostat to regulate the current, and an intrauterine electrode, we know that electrolysis takes place at four points: (1) in the cells of the battery; (2) in the water in the rheostat; (3) between the clay and the skin of the patient, and (4) at the point where the internal electrode touches the mucous membrane of the uterus.

That electrolysis does take place in the tissues is probable from the fact that storage of electricity takes place in a patient subjected to the electrolytic treatment. The patient becomes a secondary battery, and is capable of giving off a current in an opposite direction to the one used from the battery. No storage of electricity could take place unless some decomposition of the fluids contained in the tissues electrolyzed had taken place. The liquids bathing the cell elements of the tissues must have become split up, and their constituents accumulated on the opposite surfaces of contiguous tissue-cells. It is also probable that the intervening tissues, other than the tumor, are affected, and that the normal tissue metamorphosis is accelerated. Parsons²_{Apr. 14} and Shaw²_{June 16} have also made chemical and microscopical studies of the action of the current on the tissues of the fibroid and reach nearly the same conclusions—that there is a moderate electrolytic action, a local effect at each pole, and a change in the nutrition and the mutual relation of the solid and fluid elements.

Some modifications have been suggested in the technique of the electrical application. Apostoli, in using the positive galvanopuncture for the relief of pain in fibroids, has employed a *gold* needle to avoid the oxidation and eschar, with consequent greatly

increased resistance, which followed the use of other metals. In the treatment of hæmorrhage he secures a uniform cauterization of the uterine mucosa by injecting into the uterine cavity *gelosine*, into the centre of which the electrode is passed. *Gelosine* is a thick, mucilaginous paste, extracted from a Japanese seaweed, and is a good electrical conductor, is harmless and easily made aseptic, and allows the employment of very strong currents. Where larger electrode tips are required he avoids the expense of gold or platinum by having them constructed of gas carbon, which is cheap and effective. He also calls attention to the fact that the local action of an electrode is greatly increased by slight diminution of its area; thus we can produce more vigorous cauterization of the uterine mucosa with an equal current strength by shortening the electrode, which can then be successively placed in contact with the mucosa from the fundus down, the time of each contact, from three to five minutes, being regulated by the effect desired.

Franklin Martin,⁶¹_{May 26} instead of the clay electrode, uses a concave metal shell with insulated edge, over which an animal membrane is stretched and the cavity filled with water. He also gets his electricity from a small dynamic machine which is easily run and regulated. Carpenter⁵³_{May 12} takes his current directly from the city *incandescent* light wires, which carry an intensity of about one hundred volts, regulating its power by means of a resistance coil. The current from any *arc* light system could not be used, as it is dangerously intense. Massey⁹_{Sept. 1} insulates his intrauterine electrodes by fusing upon them a sufficient quantity of pure shellac. Any stiff sound may be thus used and the covering repaired or sterilized at any time by reheating over a lamp-flame.

Favorable results from treatment have been reported by Benedikt,⁴_{July 23} Brown,¹⁰⁴_{Jan. 7} who has used electricity for twelve years, Campbell,²²_{June 13} Elder,²⁶_{Jan. 12} Gibbons,²_{June 16} Hovent,²⁵⁶_{June 15} Putnam Jacobi,²⁷_{Aug.} Kirmisson.¹⁴_{Aug. 26} Napier,²_{June 30} Playfair,⁶_{July 28} Robson,⁶_{Aug. 25} Rosebrugh,³⁹_{Jan.} Scott,²⁷_{Mar.} Smith,¹³⁰_{June} Stirton,²¹³_{June} Tivy,²_{June 30} and Spencer Wells.²_{May 12} Franklin Martin⁶¹_{May 26} during 1887 employed strong, accurately measured doses of galvanism six hundred and twenty-three times in fifteen cases of uterine fibroid, absolutely curing five, symptomatically curing five, and benefiting four. He considers a current of from fifty to one hundred milliamperes, measured with patient in circuit, sufficient, but has used without injury up to one thousand milliam-

pères. Werner²⁷_{Apr.} speaks of the systemic tonic effect which she has noticed in addition to the benefits to the fibroids.

On the other hand, we hear many words of caution from those who have experienced more or less disastrous results, and of doubt from those who have not found the tumors to disappear so completely or rapidly as the extravagant claims of some had led them to expect. "Electricity is a fascinating middle course between physic, often so impotent, and the knife, often so fatal. Apostoli's electrolysis is fascinating, because, unlike palliative treatment, it means 'doing something,' whilst many believe that it involves neither the difficulties nor the risks of operation. Experience is proving, however, that Apostoli's method requires great skill and demands many precautions, and that it is not altogether free from danger. As to permanent results, even so respected an authority as Dr. Keith depends upon the words of another, and that other is Apostoli himself."²_{Mar 10}

Villa¹⁶²_{Jan. 25} states that where diminution in size has seemed to follow the treatment, careful measurements have proved it to be in most cases illusory, these being simply a downward displacement of the tumor; he considers electricity as merely an uncertain palliative. Steavenson²_{May 12} also considers it only a palliative measure in most cases, but better than any other procedure short of the knife. Holland,²_{V.1,p.160} Rutherford,²_{July 14} Gelli,⁴⁶³_{June} Heywood Smith,⁴⁹_{Feb.} Busford,²_{Apr. 14} Knowsley Thornton,²_{Mar. 24} Tait,²_{V.1,p.493,1065} Parvin,²⁷_{Oct.} and Baker,²⁷_{Oct.} call attention to the dangers from sepsis, abscess, cystic degeneration, or inflammation which may follow the treatment. Van de Warker²⁷_{Oct.} warns that galvano-puncture of any pelvic tumor which may be cystic is extremely dangerous to life. Carpenter⁵³_{May 12} does not think the use of more than one hundred milliamperes with patient in circuit safe.

We have found the treatment by electrolysis, without puncture, tedious, uncertain, and disappointing. We consider it more than doubtful that the diminution is more than temporary. The arrest of hæmorrhage by electrolysis, with the positive electrode in the uterine cavity, is by no means certain. Vaginal galvano-puncture, on the other hand (and thus far we have not thought it safe to perforate the abdominal walls with the large needles which we always employ), has in four cases of large hard and soft myomas produced a perfect cure, and in some other cases still under obser-

vation has produced a decided diminution in size. We have observed one disagreeable result where there was a localized gangrene with septic absorption from the needle puncture. Removal of the sloughing tissue resulted in rapid disappearance of the sepsis and complete cure of the patient.

Operative.—The hæmorrhage in cases of uterine fibroids comes, not from the tumor, but from the hypertrophied uterine mucosa, and is directly proportionate to its area. Coe⁵⁹_{Jan.28} has found that in certain cases the hæmorrhage can be diminished for a considerable period by thoroughly scraping away the hypertrophied endometrium and repeating the operation as often as may be necessary to keep the metrorrhagia in check. This measure is comparatively harmless, and so often successful that we are justified in giving it a fair trial before resorting to severer methods. Kalténbach³¹⁷_{Nov.10} speaks favorably of slow dilatation of the uterine canal as a measure for suppressing the bleeding.

Vaginal enucleation of submucons or pediculated growths has been done by twelve operators during the past year eighteen times, with one death.

Secheyron,¹⁰⁰_{Sept.} in a review of the surgical treatment of myomata, strongly advises "morcellement" for submucons growths. Vulliet,²⁴_{Dec.11} in somewhat similar cases, would employ the *écraseur* for pediculated growths, and for sessile forms incision of the capsule, followed by ergot, tampons, and electricity, and then, if not spontaneously expelled, enucleation by the fingers.

Suñer,⁷⁴¹²_{p.496} successfully removed a large calcified fibroid by morcellement from the uterus of a sixty-five-year-old woman in three sittings.

Felsenreich,⁸⁴_{Dec.24,'97} removed a large, cervical polyp from a patient in the eighth month of pregnancy. Delivery at term was normal.

Haggard,¹_{Jan.14} used continuous irrigation with a hot 105° F. (40.5° C.) carbolyzed solution as a means of arresting sepsis in a case of attempted enucleation where the remaining portion had become necrotic. Marked pyæmic symptoms had supervened, which could only be controlled by continuous irrigation for seven days.

Faucon,²²⁰_{Mar.30} records an interesting case where a fibrous polyp had descended through the cervix into the vagina, its pedicle being

attached to the lateral face of the uterus. The loop of an écraseur was passed over what appeared to be the pedicle, but when this was divided it was found that a piece had been cut out of the entire thickness of the uterine wall. The opening was sutured, the uterus replaced, and the patient made a good recovery.

Phenomenow³⁵⁴_{Mar.} made successful use of a novel method of controlling uterine hæmorrhage in a case where he had removed a polypoid myosarcoma which had been attached by a thick pedicle to the right side of the uterine cavity. The pedicle contained a large artery which could not be controlled by the usual methods. Hæmorrhage ceased at once when he closed the external os with six stitches; these were removed on the fourth and sixth days.

Vaginal Hysterectomy.—Heywood Smith,⁴⁹_{Feb.} Péan and Secheyron,¹⁰⁰_{Sept.} Byford,²⁵¹_{July} Murphy,²_{July 14} Bucquet,¹⁷_{Sept. 1} and Vroblecki,¹⁷_{Oct. 18} have reported successful cases of hysterectomy for fibroids. The operation is more difficult than in cancer cases on account of the size of the growth. After loosening the uterus from its vaginal attachment it can be pulled further down and, if necessary, reduced in size by morcellement (Secheyron), forceps to broad ligaments when convenient to apply, or sutures if they have been stretched far upward by the growth.

Castration.—In this it is important that *all* of the appendages should be removed, which is often very difficult on account of the presence of the tumor and adhesions. Estrada⁷²⁸_{Oct. 12} thoroughly believes in the operation, and would perform it in the majority of cases where life was not immediately threatened. The results obtained have certainly been excellent.

Reporter.	Where Reported.	No. of Cases.	Result.	Remarks.
Terrillon.....	Annales de Gynécologie, March.....	9	Cure.	One died seventy days after operation of obstruction of bowel.
Segond.....	" " June.....	4	"	
Bouilly.....	" " ".....	8	"	
Lunn.....	Lancet, April 7.....	1	"	
Tuttle.....	American Journal of Obstetrics, July.....	1	"	

Abdominal Hysterectomy.—The main point at issue still continues to be the treatment of the stump, and though the intraperitoneal methods are theoretically the most surgical and scientific, in actual practice the extraperitoneal method gives much the better percentage of recoveries. This is clearly shown in Table II,

CASES OF VAGINAL HYSTERECTOMY FOR CANCER, REPORTED DURING 1888.

Operator.	Where Reported.	No. of Cases	Method.	Immediate Result.
Baldy . . .	Polyclinic, June	1	. . . . .	Recovery
Bouilly . . .	Medical Press and Circular, Nov. 7.	30	. . . . .	7 Deaths
Bantock . . .	British Gynecological Journal, Aug.	1	. . . . .	Recovery
Byford . . .	Journal American Medical Association, May	1	. . . . .	Recovery
" . . .	Obstetric Gazette, Aug.	1	. . . . .	Recovery
Byrne . . .	American Journal Obstetrics, Feb.	1	. . . . .	Recovery
Currier . . .	Medical News, Aug.	1	. . . . .	Recovery
Demons . . .	Journal de Médecine de Bordeaux, Aug. 21	1	Clamps	Recovery
Duret . . .	Jour. des Sciences Méd. de Lille, Jan. 6 & Sept. 21	2	Clamps	Recovery
Dudley . . .	Obstetric Gazette, Aug.	1	Clamps	Recovery
Ethelridge . .	Peoria Medical Monthly, Oct. 7	7	. . . . .	1 Died
Engstrom . .	Répertoire Universel d'Obstet. et de Gyn., July 25	1	Ligature	Recovery
Frank . . .	Berlin Letter, Medical Press and Circular, Oct. 21	25	. . . . .	All Recovered
Fenger . . .	Chicago Medical Journal and Examiner, Jan.	4	. . . . .	Recovery
Gardner . . .	Medical News, July 21	6	. . . . .	1 Died
Gordon . . .	Journal American Medical Association, Sept. 1	3	. . . . .	1 Died
Gutierrez . .	Répertoire Universel d'Obstet. et de Gyn., Oct. 15	1	Clamps	Recovery
Halbert . . .	Weekly Medical Review, April 11	1	Ligature	Recovery
Hunter . . .	American Journal Obstetrics, June	2	Clamps	Recovery
Johnson . . .	Journal American Medical Association, Jan. 7	1	. . . . .	Recovery
Jones . . .	International Journal Surgery & Antiseptics, Apr.	1	. . . . .	Recovery
Lomer . . .	Centralblatt für Gynecologie, May 19	2	. . . . .	1 Died
Laudan . . .	Medical Press and Circular, Aug. 29	2	Clamps	Recovery
Lohlein . . .	London Medical Recorder, Aug. 29	1	. . . . .	Recovery
Le Bee . . .	Gazette des Hôpitaux, Jan. 10	1	. . . . .	Death
Macan . . .	Dublin Journal Medical Sciences, June	3	. . . . .	Recovery
Mundé . . .	American Journal Obstetrics, March	1	Ligature	Recovery
Nieberding . .	Munchener Medicinische Wochenschrift, Jan. 3	1	. . . . .	Recovery
Ott . . .	Gazette de Gynecologie, June	11	. . . . .	Recovery
Pollakoff . . .	La Semaine Médicale, Nov. 14.	6	Clamps	2 Died
Paquet . . .	Bulletin Méd. du Nord, June 22	1	. . . . .	Recovery
Pozzi . . .	Annales de Gynecologie, Aug., Sept.	6	Clamps	1 Died
Polguère . . .	Bulletin de la Société Anatomique, Feb.	1	. . . . .	Recovery
Pureell . . .	British Gynecological Journal, Feb., Aug.	2	. . . . .	Recovery
Rowan . . .	Australian Medical Journal, Sept. 15	2	. . . . .	1 Died
San Juan . . .	Gaceta Médica, Mexico, Oct. 1	1	. . . . .	Recovery
Stadsgaard . .	Report of Dr. F. Levison, corresp. ed., Copenhagen	14	Clamps	1 Died
Stinchair . . .	Medical Chronicle, Feb.	2	. . . . .	Recovery
Sabara . . .	La Thérapeutique Contemporaine, July 20	5	. . . . .	Recovery
Swartz . . .	Western Medical Reporter, June 10	1	. . . . .	Recovery
Taylor . . .	Polyclinic, Sept.	1	. . . . .	Died
Temple . . .	Canadian Practitioner, Nov.	1	Clamps	Recovery
Terrillon . . .	Journal de Médecine de Paris, July 29	2	Clamps	Recovery
Terrier . . .	La Semaine Médicale, Nov. 7	21	Clamps	4 Died
Thompson . . .	American Journal Obstetrics, June	1	. . . . .	Recovery
Wathen . . .	American Practitioner and News, Nov. 21.	2	. . . . .	Recovery
		183		22 Died

Recurrence noted in 23. Permanent cure claimed in 13.

p. 37, where the results in a large number of cases by a few experienced operators is shown. Table I consists of isolated cases culled from the journals, and would be unreliable for purposes of comparison. The method adopted by Albert and others which gives the best results is in general as follows: The uterus and tumor is lifted up from the pelvic cavity and an elastic ligature passed about the cervix. If the bladder is drawn upward over the anterior surface of the tumor, it is not dissected off, but a pin is passed through the superficial layers of the uterine wall just above the bladder, and then the ligature passed just above the pin. If the tumor dips down into Douglass' pouch a pin may be applied

in the same manner to prevent too low a constriction. The tissue over the tumor is now incised, and the growth rapidly enucleated by scissors, fingers, or elevator. The pedicle is fixed in the lower angle of the wound; if there is too much tension it may be relieved by slipping the ligature up or applying another above it.

TABLE I.

CASES OF ABDOMINAL HYSTERECTOMY FOR FIBROIDS REPORTED DURING 1888.

Operator.	Where Reported.	No. of Cases.	Result.	Pedicle.	Indication.
*Barton.....	Journal American Medical Association, May 5.	1	Death.	Intraperit.	Hæmorrhage.
†Bantock.....	British Gynaecological Journal, August.....	1	Recovered.	Extraperit.	
†Bandl.....	Medical Press and Circular, September 12.....	1	"	"	
Boldt.....	American Journal of Obstetrics, May.....	1	"	"	Size.
‡Byford.....	Journal American Med. Association, Feb. 11.....	1	Death.	"	
Byford.....	Obstetric Gazette, August.....	1	Recovered.	"	
Baldy.....	Medical and Surgical Reporter, June 2.....	1	Recovered.	"	Pressure.
Byrnes.....	American Journal of Obstetrics, February.....	1	Death.	Intraperit.	
Cohn.....	Centralblatt für Gynäkologie, No. 28.....	1	Recovered.	"	H. and weight.
†Dagnon.....	Bulletin de la Société Anatomique.....	1	"	"	H. and cachexia.
Dudley.....	American Journal of Obstetrics, August.....	1	Death.	Extraperit.	
**Edis.....	British Gynaecological Journal, August.....	1	Recovered.	"	
Goodell.....	Maryland Medical Journal, May 19.....	1	"	Intraperit.	H. and size.
Greathead.....	British Medical Journal, February 25.....	1	"	Extraperit.	
Homans.....	Boston Medical and Surgical Journal, March.....	1	"	Intraperit.	
†Hill.....	Medical Record, September 22.....	1	"	Extraperit.	
†Hill.....	American Journal of Obstetrics, October.....	1	"	Extraperit.	
Keller.....	Journal American Med. Association, March.....	1	"	"	Hæmorrhage.
‡Kinloch.....	North Carolina Medical Journal, January 1.....	1	"	Extraperit.	H. and weight.
Keen.....	Progress, May 12.....	1	"	"	Pressure.
††Morris.....	Lancet, June 12.....	3	2 Rec., 1 D.	"	H. and size.
Maury.....	Memphis Medical Monthly, March.....	1	Recovered.	"	
Mundé.....	American Journal of Obstetrics, March.....	1	"	"	
Meredith.....	British Medical Journal, November 17.....	1	"	"	Impacted.
McMordie.....	Lancet, March 31.....	1	"	Extraperit.	Hæmorrhage.
Ott.....	Vratch, No. 9.....	1	"	"	
Oliver.....	Lancet, February.....	1	"	"	"
Plummer.....	Lancet, July 28.....	1	"	"	H and weight.
Price.....	Transactions Phila. Obst. Society, February.....	2	1 D., 1 Rec.	"	
*†Prewitt.....	Weekly Medical Review, February 1.....	1	Recovered.	"	
Rendu.....	Lyon Medical, October 25.....	1	"	"	
***Richelot.....	L'Union Médicale.....	1	Death.	"	
Reeves.....	British Medical Journal, April 11.....	1	"	"	
Sinclair.....	Medical Chronicle, September.....	1	Recovered.	"	
Smith.....	Australian Medical Journal, February 15.....	1	"	"	
††Slavjansky.....	Jour. d'Obst. et Gyn., St. Petersburg, No. 6, '87.	1	Death.	"	
Strauss.....	New Yorker Medicinische Presse, May.....	1	Recovered.	"	
Tait.....	British Medical Journal, March 21.....	1	"	"	
Von Hoffman.....	Pacific Medical and Surgical Journal, Sept.....	1	"	Intraperit.	
Wyman.....	Medical Age, February 10.....	1	"	Extraperit.	

43 with 9 deaths.

* Cause of death, uræmia.

† Enucleation.

‡ Enucleation, leaving uterine intact.

§ Exhaustion.

|| Vaginal drainage.

†† Death from hæmorrhage.

** Enucleation.

†† Drainage.

‡‡ Bladder accidentally opened but sutured and healed. Stump sloughed and formed abdomino-vaginal fistula.

††† Forty-seven pounds; drainage. ††† Exposed to scarlatina on twelfth day. Died third week of sepsis.

††† Degenerated fibroid.

*** Death from uræmia.

††† Sepsis.

TABLE II.

Operator.	Where Reported.	No. of Cases.	Intraperitoneal Pedicle.		Extraperitoneal Pedicle.	
			Recovery.	Death.	Recovery.	Death.
Albert.....	Wiener Medicinische Presse, April 15.....	29	...	...	19	1
Staudé.....	Centralblatt für Gynækologie, April 21.....	11	2	4	4	1
Terrillon.....	Annales de Gynækologie, May.....	16	1	1	11	3
Wehmer.....	Zeitschrift für Geburtshülfe und Gyn.....	27	2	3	22	0
Gersny.....	Weimer Medical Wochenschrift, February 18.....	22	11	4	6	1
Braun.....	"	38	...	...	32	6
Krassowsky.....	Centralblatt für Gynækologie, March 21.....	19	5	2	6	6
		153	21	14	100	18

The pin first inserted serves to suspend the stump. The peritoneum of the stump is stitched all around to that of the abdominal wound so as to form a "collarette." Careful antiseptic dressings. The rubber ligature does not cause necrosis of the stump. Careful and continuous disinfection, or, rather, asepsis, of the stump must be maintained, for in its infection lies one of the greatest sources of danger.

Fatal cases of removal of fibro-cysts of the uterus have been reported by Banker,¹⁹⁸_{Jan.} Fenger,⁶¹_{Oct. 27} and Tuholske.⁶⁵_{Nov.} A successful case by Merz,²⁰²_{Oct. 25} is interesting for the reason that the removal of the tumor necessitated the ablation of the uterus and appendages, and the fact that the upper portion of the vagina was retained in the abdominal wound, the cervix coming away through the latter on the nineteenth day.

Wyman,²⁰²_{Feb. 10} notes a case where, as tumor or appendages could not be removed on account of adhesions, he tied the enlarged arteries of the left broad ligament. The patient recovered and the growth of the tumor ceased. Mosetig,²_{Nov. 24} cites a case where a large myoma shrunk rapidly after an explorative laparotomy, so that in two weeks it could scarcely be found. He believed the disappearance to be caused by the intense hyperemia which occurred at the time of the operation, just as soft sarcoma may disappear after severe erysipelas.

CARCINOMA UTERI.

The differentiation of beginning carcinoma from less malignant conditions of the uterine mucosa or body is often, even under the searching glance of the microscope, a matter of unusual difficulty or doubt. The vital importance of an accurate diagnosis is well appreciated, and any hint or fact, however small, which will render this diagnosis more quick and certain is of value. Fürst,³⁹³_{Oct. 2} considers simple glandular hyperplasia, in which the uterine glands, though increased and enlarged, have not lost their typical characteristics and in which there is no special cellular infiltration and no tendency to deeper extension, as benign. Yet, as these forms tend to become malignant, excision is advised. Glandular hyperplasia, whether localized or general, where there exists a tendency to atypical gland change and cellular infiltration deep into the interstitial tissue, is to be considered as malignant or as having such a strong tendency in that direction as to call for total extirpation of the

uterus. Adeno-carcinoma, in which the typical gland formation in great part disappears and epithelial infiltration and cancer nests exist, is absolutely malignant. Even after total extirpation of the uterus the ultimate prognosis is bad, as the disease is likely to have spread beyond operative reach. Cushing²⁵ June lays great stress on the absence of epithelial covering and on small cell infiltration as indicating malignancy.

It has been generally supposed that in the early stages of cervical epithelioma the corporeal endometrium was not affected; that the disease was confined to the cervix until the parenchyma at the internal os became involved. A correct understanding of this proposition is very important in deciding upon the relative values and indications for total extirpation or high amputation of the cervix. Abel⁹⁵ B1.32, H 2 has made a study of the microscopical characteristics of the uterine mucosa in several cases of malignant disease limited to the cervix, in order to determine its practical bearing upon this question. In every case he found the corporeal endometrium markedly changed, while the cervical was only slightly diseased, the microscopical appearances being strongly suggestive of round- and spindle- celled sarcoma. Fränkel,⁹⁵ B1.33, H 1 from similar studies, claims that the changes in the corporeal endometrium are those ordinarily observed in chronic endometritis with the interstitial tissue showing an increased number of spindle cells. He, however, agrees with Abel that in carcinoma of the cervix total extirpation is preferable to high amputation.

Cases of carcinoma with a uterus "bilocularis" have been reported by Janvrin²⁷ Jan. and Orthmann.³¹⁷ No. 28 Uterine carcinoma is excessively rare before puberty. Ganghofner⁴⁰⁵ B1.9 notes a case found in an eight-year-old child. The cervix was amputated, and all went well until the third day, when the patient from ward infection developed small-pox, from which she died. The microscopical appearances of the growth were typical of carcinoma.

Löhlein³¹⁷ July 29 speaks of an unusual symptom observed in a patient with carcinoma of the uterine body, there being periodical attacks of pain, which began at ten o'clock every morning, reached their greatest severity at noon, and disappeared at four in the afternoon. This phenomenon was first noted by Simpson.

Hawes⁵⁹ July 28 calls attention to the rarity of fibroid tumors in Bohemia, as contrasted with the great prevalence of cancer. This

he attributes to the greatly depreciated physical condition of the working classes, resulting from defective food, bad ventilation, and hard labor for generations.

Medical Treatment.—This is, unfortunately, essentially palliative. Fränkel³¹⁷_{Sept. 15} speaks favorably of the local use of zinc chloride in strong solution in inoperable cases of carcinoma, while Martin, Olshausen, Ehlers, and others have found it somewhat unmanageable, as it is difficult to define its caustic action.

Browne¹⁰¹_{Mar. 24} reports a case where, after curetting, he applied a saturated solution of zinc chloride on a tampon. On the tenth day the whole uterus came away. There was no rise of temperature, and the patient did well. This case is nearly identical with one recorded by Mundé²⁷_{Aug., 172} where, under similar circumstances, a weak solution of ferric sesquichloride was applied, and the whole uterus came away on the tenth day. The cancer recurred in the cicatrix two months later. Similar cases have been reported by Barker, Mettaur, and Habet, but the only ones in which the necrotic uterus was found and recognized are the two above noted.

Schramm,³¹⁷_{Mar. 24} finding none of the ordinary methods of treatment for inoperable carcinoma satisfactory, has employed and especially recommends the injection of antiseptics into the diseased tissues. He believes that, even if the existence of a micro-organism as the causative factor has not as yet been established, enough has been proved to make the procedure a rational one. A few drops of a weak solution of sublimate, half grain (0.032 gramme) to one grain (0.064 gramme) to one drachm (3.89 grammes), is injected hypodermically two or three times a week, sometimes deeply, sometimes superficially. There is no fear of mercurial poisoning, as the absorptive powers of the degenerated tissue are but slight. Under this treatment fetor and purulent discharges cease, destructive tissue changes are lessened, hæmorrhage is less frequent, and the general condition improves. Accidental bleeding is best controlled by astringent injections and vaginal tamponade. Opium by rectum or morphia hypodermically to relieve pain. When the disease extends to bladder, rectum, or peritoneum, so that the sublimate injections appear dangerous, we must be content with antiseptic vaginal douches. Great stress is laid upon the importance of a vegetable diet for those suffering from cancer. The persistent use of these methods, general and local, will, Schramm claims, retard

the progress of the disease and keep the patient a longer time in a tolerable condition of health.

The following sedative and antiseptic suppositories have been extensively used in Paris ²²_{Jan. 11} :—

R Iodoformi,	gr. 10 (0.65 gramme).
Camphoræ,	gr. 4 (0.26 gramme).
Extr. bellad.,	gr. 1 (0.065 gramme).
Ol. theobromæ,	q.s.

Mix and make one suppository ; to be placed in the vagina at night.

Tornery ¹⁵²_{July 2} finds that injections of water at about 104° F. (40° C.) for at least half an hour, morning and evening, disinfect the vagina, diminish the ichorous discharge, the loss of blood and the pain, and improve the general health.

Duchesne ²⁹⁶_{Feb. 8} recommends the following :—

R Acid acet. dil.,	300 parts.
Tinct. eucalypti,	45 “
Acid salicylici,	1 “
Sodii salicylati,	20 “

M. Sig. : One to five tablespoonfuls to a quart of warm water for daily vaginal injections.

Larrabee ²²⁴_{Nov. 10} reports favorable palliative results from the local use of the milk of alveos.

Longaker ¹_{Mar. 17} has employed terebene locally as recommended by Cordès. In one case the patient died soon after it had been used, with strangury and suppression of urine, supposed to be caused by its influence.

Operative Treatment.—The only treatment of carcinoma which, as yet, may offer hope of ultimate cure is early excision, and that operative method is best which can most radically remove the diseased tissue with the least possible immediate danger to life. Could the limits of the cancerous growth be always defined, could it be proved that the uterine mucosa, in most cases of cervical growths, remained normal above the internal os, then the greater merits of high amputation as compared with total uterine extirpation would be recognized at once. But we are forced to believe that it is only in exceptional cases that this can be done, and that usually the disease is not discovered until infection has passed beyond the circle of the inner os.

High amputation has given excellent results in the cases of Baker and of Reamy, ²⁷_{Oct.} who in fifty-seven *selected* cases where the disease had not extended beyond the cervix, report twenty-six

which have shown no sign of recurrence after periods ranging from one to fifteen years. The primary mortality was only two.

Schantz³¹⁷ has claimed even better results than this for total extirpation in *selected* cases treated by experienced operators.

The accepted indications for hysterectomy for cancer are clearly defined. The operation should be done in cases where the disease is recognized before it has extended beyond the uterus, *i.e.*, where there is no infiltration of the parametric tissues and no glandular enlargements, but is not justifiable as a palliative measure. Inoperable cases are best treated by thorough curetting, followed by the cautery or caustics. Etheridge,¹⁴⁹_{Oct.} Grünewald,²¹_{Nov. 5} and a few other enthusiastic operators consider the operation so safe under the improved technique that they would extend the indication to certain other serious conditions, such as procedentia, certain small fibroids, and inveterate hystero-neuroses.

Differences of opinion concerning the technique of vaginal hysterectomy are mainly regarding the use of the forceps or the ligature. Brennecke and Leopold, whose results certainly have not been excelled, if they have been equaled, employ the ligature very much in the manner described in the ANNUAL of 1888. Brennecke (Maury⁷⁴_{Oct.}) uses for drawing down and holding the uterus a gently curved, blunt sound, from which, when it has been passed to the fundus, two claws are made to project into the cornua. Leopold divides the tissues about the uterus, step by step, ligating as he goes, and does not open the *cul-de-sac* until it is necessary for him to use the finger for a guide in placing the last ligatures.

The advantages claimed for the forceps are principally in the line of increased ease and speed of operation and more efficient hæmostasis. Péan,⁹¹_{May 10} Terrier,³_{Nov. 7} Etheridge,¹⁴⁹_{Oct.} and Dudley²⁷_{Oct.} speak most enthusiastically in their favor. On the other hand, Pozzi³_{Mar. 2} holds that forcipressure does not give as perfect security against hæmorrhage as a skillfully applied ligature. He considers that it renders antisepsis more difficult and convalescence more slow and painful; that it should not be substituted by choice for the ligature; that in cases where the uterus alone is involved, where it is movable and easy to manipulate, the placing of ligatures is not so difficult. Forcipressure becomes really necessary only in those cases where hysterectomy should not have been attempted. In a case where he had accidentally ligated both ureters, as manifested

by complete suppression of urine, Macan¹⁶ v. 1, p. 526 twenty-four hours after the operation, incised the bladder freely in the median line, everted the edges, found the orifices of the ureters, passed a probe down each to the point of obstruction, and then cut the ligature that seemed nearest this point. On the cutting of the second ligature on one side there was a gush of urine, which also followed the division of the third on the other side. There was no hæmorrhage. The bladder wound was sutured and the patient recovered, after developing a slight uretero-vaginal fistula on the tenth day.

Reichel²⁹³ Ed. 15, H. 1 describes several cases of fatal ileus following vaginal hysterectomy, in all of which the vaginal wound had been left open after the operation. He believes that the vagina should be closed.

DISORDERS OF MENSTRUATION AND STERILITY.

General Considerations.—Lemière,²²⁰ Feb. 17 in an elaborate and erudite paper concerning the relations between ovulation, menstruation, and fecundation, states that menstruation depends on ovulation, the two functions being intimately united in one physiological state. Menstruation which occurs without ovulation is due to an organic habit of the nerve-centres and uterus which enables the latter to continue the function independently. In this way is explained the persistence of menstruation after complete removal of both ovaries, or ovaries and tubes. Menstruation does not occur if the ovaries be congenitally absent or if they be removed before puberty. If a woman has never menstruated but has menstrual molimina she may have some hopes of bearing children; if she has had no molimina she will almost certainly never conceive. There is no agenesic period, but only a time when fecundation is less frequent, conception being most apt to occur just after or sometimes just before a menstrual period. The mean duration of pregnancy is two hundred and seventy days.

Tait,² Mar. 24 does not believe that there is any connection between ovulation and menstruation, holding that the ovular theory is absolutely untenable.

The influence of menstruation upon the pulse and temperature has been studied by Repreff,⁵⁸⁶ No. 35, Nov. 24 who finds that in health the temperature and pulse fall a day or two before menstruation, the temperature rising somewhat after the cessation of the flow. In chronic uterine disease there is a rise of temperature during the

period, but with a fall on the first and last days. Women with tubal trouble have a febrile temperature before and after the flow without any fall below the normal.

Koljisky⁸¹_{Jan.} relates the case of a girl of eighteen who was relieved of hysterio-epilepsy, and afterward of irregular menstruation, by hypnotic suggestion. Other instances have been noted where hypnotic suggestion has proved of value in this respect in hysterical or easily hypnotized subjects.

Instances of precocious menstruation have been noted by Barnes,¹⁹_{Dec.31, '97} who records a case, now eleven years old, that has menstruated regularly since the age of sixteen months; Diamant,⁵⁷_{Sept.29} whose patient has been regularly unwell since the age of two years; Kornfeld,³¹⁷_{May 14} where a child of three years menstruated regularly for several months in consequence of irritation produced by masturbation, the flow ceasing when the habit was cured, and Sheard,²_{V.1,p.383} where menstruation appeared at nine. All of these children were more or less mentally deficient.

Butler,²²_{Feb.8} Rein,⁵⁸⁶_{No.7} Chapman,²_{Mar.31} Hardon,²⁰⁷_{Apr.} and Cooper²⁰⁷_{Apr.} have each reported instances of vicarious menstruation, the cases of Butler and Rein being of particular interest. In the first case there was a vesicular, purpuric eruption of the arms and shoulders which bled easily and freely and which appeared for from five to seven days at monthly intervals during a period when normal menstruation was absent. In the second case the patient bled regularly from the scar of a laparotomy wound at the same time that the normal menstrual flow occurred. A cyst of the right ovary had been removed and it was thought possible that a tube or uterine cornua had been stitched, together with the pedicle, into the abdominal wound.

Currier,⁹_{Feb.18} calls attention to the influence of obesity in young women in inducing scanty menstruation and sterility, this occurring whether they have previously borne children or not. The causes were the same as would lead to obesity in the other sex. The treatment was by regulated exercise, diet, massage, the use of laxative mineral waters, and uterine or general faradization. Treatment in our hands often proves unsatisfactory.

Artificial suppression of the menses in chlorosis has been recommended by Loewenthal¹⁵¹_{June 1} and by Gehrung,²⁷_{Oct.} both of whom report most gratifying results. The former employs as the repres-

sive agent vaginal douches of hot water 120° F. (49° C.), with rest in bed, the latter the antiseptic tamponade. No disagreeable results have been noticed by either.

Amenorrhœa.—In those forms of amenorrhœa which occur in pale, flabby, anæmic women, Bigelow²³_{Sept.} gives most excellent advice when he says: "Don't force the flow, but persist in a reconstructive and tonic treatment, and when the loss can be afforded the flow will come."

DeWees¹⁹_{June 30} uses the following treatment in emansio-mensium with uniform success. He first prescribes:—

R Liquor ferri et quiniæ citratis, . . . f℥ 1 (31.1 grammes).
 Liquor potassii arsenitis, . . . f℥ 3 (11.65 grammes).
 Atropinæ,
 Strychniæ, āā gr. ½ (0.032 gramme).
 Elixir aurantii, q.s. ad f℥ 8 (248.8 grammes).

M. Sig: Teaspoonful in water, before meals, three times daily.
 The ingredients or dose to be increased according to the tolerance of the patient.

This is continued until there is manifested the peculiar menstrual malaise, when it is discontinued and the following given:—

R Potassii permanganat, gr. 10 (0.65 gramme)
 Divide into pills no. x, compressed or in capsule.

Sig.: One pill, followed by one-half glassful of water, before meals, three times daily.

Also:—

R Mangesii binoxidi, gr. 10 (0.65 gramme).
 Divide into pills no. x, compressed or in capsules.

Sig.: One pill after each meal, three times daily.

By the second or at most the third day after taking these, the flow usually becomes fully established. If the manganese does not fully effect this at the first attempt, we have, however, a stated period from which calculation can safely be made for the next period. The first prescription is relied on during the interval, and the pills commenced about three days before the expected time. In ordinary menstrual suppression he finds the last two recipes, used as above, all that can be desired.

Ellingwood,¹⁹²_{Oct.} O'Donavan,¹⁰⁴_{Jan. 7} and others favor the manganese binoxide rather than the permanganate.

Macdonald¹⁵_{June} gives the permanganate in one-grain pills three

times a day and after three months in two-grain doses, in amenorrhœa associated with mental disease. He reports most favorable results. The pills should be given for fully three months after the courses appear and must be taken without intermission.

Whitehead²³³_{Mar.} and Hammah¹⁸⁶_{Apr.} have each accidentally found that santonine given in ten-grain doses at night is a most reliable emmenagogue, particularly in chlorotic patients. They have used it in several hundred cases with no failure. Ringer has noted the same effect from the drug, and we have seen it used with good effect. Stratton¹⁹⁹_{Feb.} considers a saturated tincture of the seeds of lappa major, given in drachm doses before eating, a most reliable drug, while Griffith¹⁹⁹_{Mar.} states that his obstetric practice has decreased since he has employed the active principle of polygonum hydro-piperoides as an emmenagogue.

The importance of care in the diagnosis of amenorrhœa is illustrated by cases of concealed menstruation dependent upon imperforate hymen which have been reported by Mitchell,⁵³_{Feb. 2} Harvey,⁵³_{Mar. 4} Currie,²_{Oct. 29} and Ghent.⁸⁵_{July} All were treated by incision and evacuation of the retained fluid and did well.

Stevens⁸⁹_{Aug.} calls attention to the entire arrest of menstruation in those victims of the morphia habit who have for some time used large amounts of the drug. Our experience has been similar.

We have found the manganese binoxide, or lactate, particularly useful in cases of anæmia, where it exerts a marked tonic effect, and in cases of temporary suppression. It is not abortifacient, is not injurious in medicinal doses, but is not an entirely efficient or reliable remedy.

MENORRHAGIA AND METRORRHAGIA.

Besides the remedies and methods mentioned under the heads of "Endometritis," "Carcinoma," and "Fibroids," to which the reader is referred and where he will find some of the most efficient means of treatment, a host of medicinal agents have been suggested:—

Hydrastis Canadensis is favorably spoken of by Barron,²⁰⁷_{Feb.} Schmidt,⁸⁸_{No. 52, '87} Rutherford,²_{July 21} and Senvowski.⁵²⁰_{No. 12} used in the form of the fluid extract in doses of from fifteen to twenty drops three times a day, and is said to be most useful where there is subinvolution. Hale¹⁹²_{Sept.} recommends the muriate of hydrastia, one-

tenth to one grain (0.0065 to 0.065 gramme), three or four times a day. This has no unpleasant taste and is better tolerated by the stomach. One great advantage of hydrastis over other remedies is its tonic and restorative property. It aids digestion and regulates the secretions. We have employed the drug, but have not obtained the brilliant results expected.

Strophanthus (Inée) is highly recommended by Poulet¹⁵¹_{Feb. 16} in the metrorrhagia of the climacteric and of very fat women during the child-bearing period. He thinks the freshly powdered seed the most reliable form and gives three-fifths of a grain (0.038 gramme) made into a pill, two the first day, three the second, and four after that, if needed.

Beck¹⁹⁹_{Mar.} considers a tincture of tiger-lily blossoms, in ten-drop doses, three times a day, a specific in the menorrhagia of relaxed anæmic women. Barker, for hæmorrhage at the climacteric, uses equal parts of fluid extract of hamamelis and hydrastis. Bamelon⁵⁷⁵_{No. 9} considers a decoction of shepherd's purse as efficient as ergotine. Idanko¹⁵⁴_{Feb. 15} believes in a decoction of the root of *Cratægus officinalis*, which is used as a popular remedy by the Russian peasants. Petresco¹⁵⁴_{Dec. 15, '97} recommends highly for idiopathic and symptomatic menorrhagias

R Bryonia dioica rad., 5 5 (19.4 grammes).

Vini albi 0 2 (one litre).

Macerate eight days and filter.

Dose four drachms every hour.

Valdes Castro⁶_{May 12} speaks highly of the free use of unripe oranges, boiled in their skins and well sweetened. Mènière¹⁵⁴_{July 1} advocates the treatment of periodical congestive menorrhagias by the use of "distilled pine-tar water," given in progressively increasing doses. Kinnear²³_{Sept.} emphasizes the value of Chapman's hot-water bag placed over the lumbar spine for the suppression of menorrhagia, as well as in the treatment of endometritis, metritis, and parametritis. The best effects are observed in patients having cold hands and feet.

We have employed with satisfactory results equal parts of fluid extract ergot and fluid extract gossypium, a teaspoonful every two or three hours. The curette and intrauterine tampon should be employed in conditions associated with hyperplastic endometritis.

DYSMENORRHŒA AND STERILITY.

Uterine flexions, endometritis, dysmenorrhœa, and sterility are an ill-flavored quartette often found in each other's company, so that the treatment of any one of these conditions is often, of necessity, modified by the presence of one or more of the others. Suggestive in this connection are the cuts shown herewith, presented in an interesting article by McGillicuddy, of St. Louis, ¹Aug. 11 on "Dilatation for Stenosis and Flexion of the Uterus."

Coquard, ¹¹⁸Aug. 20 in a study of membranous dysmenorrhœa, concludes that the exfoliated uterine mucosa presents the lesions of an ordinary endometritis, and can usually, by histological examination, be differentiated from the decidua expelled in early abortion

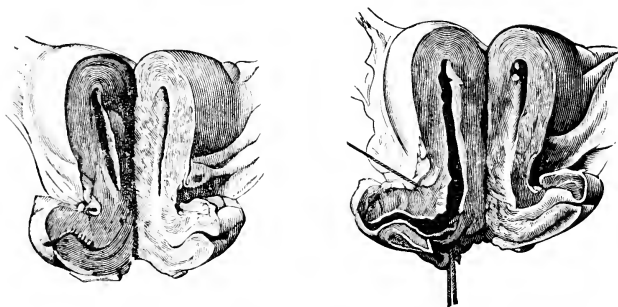


FIG. 4.—MECHANICAL OCCLUSION OF UTERINE CANAL BY ANTEFLEXION.
(*New York Medical Journal*.)

or in ectopic fertilation. The disease is an exaggeration of a physiological process, with a varying pathogeny. Sterility is a usual sequence when the trouble is established early in menstrual life. Medicine is of little use, dilatation and the curette giving the best results. Chéron ¹⁰⁸May 1 treats it by thorough uterine dilatation under an antiseptic fluid and packing of the cavity with iodoform gauze.

Boulware, ¹⁰²Aug. in speaking of the frequency of dysmenorrhœa in girls at boarding-schools, states that masturbation is a much more frequent cause than is usually admitted by the profession.

The most efficient treatment for ordinary forms of dysmenorrhœa is careful dilatation, with the steel dilator, to the extent of an inch or an inch and a quarter, using careful antiseptic precau-

tions. After the dilatation it is well to insert an intrauterine pencil containing ten grains of iodoform.

Goodell¹⁴⁷ has employed this treatment in three hundred and twenty-two cases without any serious harm and with almost invariable and permanent relief. Madden,² Rogers,²⁵⁷ Goulet,⁵⁹ and Wathen¹ advocate similar measures, the latter operator employing

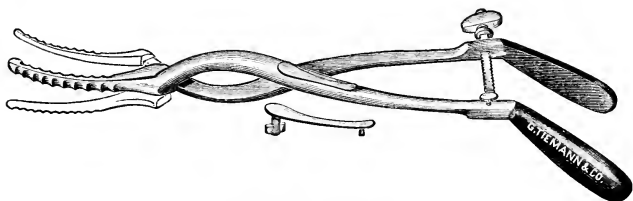


FIG. 5.—WATHEN'S UTERINE DILATOR.
(*New York Medical Journal*.)

the instrument shown in Fig. 5. In addition, if there be endometritis, the curette may be used, and if marked flexion a short intrauterine stem; the latter being carefully watched. Chéron¹⁵⁴ and Reverdin¹⁹⁷ speak enthusiastically of dilatation during irri-

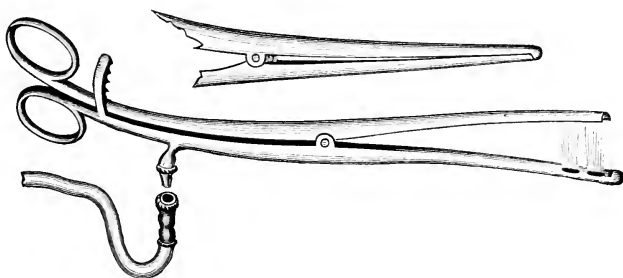


FIG. 6.—REVERDIN'S INTRAUTERINE IRRIGATING DILATOR.
(*Revue Médicale de la Suisse Romande*.)

gation with a stream of hot water, this passing through one of the branches of the dilator represented in the annexed cut, one blade of which is made hollow for the purpose. Dilatation by this method is said to be efficient, rapid, and painless. Antiseptic or other agents may, of course, be added to the water.

Poulet²¹¹ and Fraipont³¹⁷ very highly favor the use of tents

because of their softening effect on the uterine tissues, and because they consider them safe when used antiseptically. Laminaria tents are used after having been kept for two weeks in a saturated iodoform and ether solution. Thus prepared, they are thoroughly antiseptic and *pliable*. They are taken from the solution with a clean forceps and inserted directly, the vagina and uterus having been previously disinfected by a vaginal douche. A pad of iodoform gauze is placed in the vagina against the cervix, and with the tent is removed in twenty-four hours. In case more dilatation is necessary, Fraipont, on account of the great danger of sepsis, prefers to complete it with Hegar's dilators, using an anæsthetic. Lee²⁷_{May} reports a case of death from sepsis following the use of laminaria tents, though careful precautions had been taken to prevent this accident. The danger of sepsis is certainly the great objection to any of the methods of slow dilatation, which otherwise possess great advantages.

Fry²⁷_{Jan.} favors dilatation by electrolysis, using an insulated bougie with an olive tip somewhat larger than the lumen of the os for the negative electrode. This is held gently against the external os until it passes without forcible pressure; then it is carried in the same way through the internal os. At the next séance a larger olive is required, and so on until the requisite dilatation is obtained. The sittings last from ten to twenty minutes, and may be repeated every five or seven days. The method is painless and safe. The positive electrode is a sponge over the abdomen or sacrum; the current used is a weak one, from four to six ordinary bichromate or Leclanché cells. Williams¹²⁸_{Sept.} gets good results from a mild galvanic current passed from suprapubic region to sacrum twice a week for several weeks.

Constitutional Treatment of Dysmenorrhœa.—Routh,²⁶_{June 1} in an excellent *résumé* of the subject, says: "Successful treatment depends upon finding and removing the cause. As a rule, it is irrational to mask the symptom of pain by giving opiates, though during a severe paroxysm it may be necessary; but even then we should add atropine, belladonna, or hyoscyamus, to relax muscular spasm, to evert constipation, and to enable us to use smaller doses of the opiate. The main objection to opium, chloral, or alcohol is that their repetition tends to their abuse. Nitro-glycerine and amyl nitrite are excellent for spasmodic cases. The bromides are

indicated in those cases where the dysmenorrhœa is ovarian. *Cannabis indica* is especially valuable where menorrhagia co-exists. A favorite prescription, both in congestive and spasmodic dysmenorrhœa, is:—

R Tr. cardam. comp.	℥ ½	(2. grammes).
Spir. chloroformi,	℥ 20	(1.3 grammes).
Liq ammon. acetat.,	℥ ½	(15.55 grammes).
Tr. bellad.,	℥ 10	(0.65 gramme).
Aq. cinnam., q. s. ad	℥ 1	(31. grammes).

A week's use of guaiacum, or sodium salicylate, will often prevent dysmenorrhœa of rheumatic origin, while for the migrainous headaches nothing is better than antipyrin in fifteen-grain (one gramme) doses, repeated every two hours if necessary. Auxiliary measures should not be neglected. Rest and warmth of skin before and during the flow is important, as is also heat applied over the abdomen, but not over the sacrum, unless we wish to check the flow. Preventive treatment may do much to make the next period less painful. Anæmia and chlorosis may be dealt with by iron, arsenic, acetate of ammonia, and laxatives. The functions of the skin, liver, and bowels should be regulated. Abuse of alcohol, sexual excesses, mental or physical overwork, and improper food should be avoided.

Chambers⁵⁹_{July} considers oxalate of cerium, in six-grain (0.39 gramme) doses every hour, a specific for the dysmenorrhœa of well-nourished, robust women, in cases where the pain comes at or before the beginning of the flow. Devillers²¹²_{May} reports cases of dysmenorrhœa relieved by hypnotic suggestion.

We have found the tincture of pulsatilla in three- to five- drop doses three times daily quite effectual when given several days before the period, chiefly in the neuralgic form, common in young women. In congestive dysmenorrhœa, saline laxatives just before the period, with hot sitz baths, and, in severe cases, a small blister over each ovarian region. In married women scarification of the cervix. For obstructive dysmenorrhœa thorough dilatation of the uterine canal. All internal medication is uncertain.

Segur¹¹⁶⁹_{June} finds the best results from the use of manganese in conjunction with the bromides, ten to twenty grains (0.65 to 1.3 grammes), with from two to five drops of the tincture of nux vomica. In neurotic cases with considerable general disturbance he finds that twenty grains of antipyrin work like a charm, the best

effect being obtained when the patient lies with closed eyes in a quiet room for half an hour after taking it. Brown,¹⁸⁶ Rivière,⁷⁰ Laget,¹⁵⁴ Germain Sée,¹⁵⁴ Windelschmidt,⁶⁴⁸ Chouppe,⁶⁶⁵ and Ortigosa,⁶⁶⁵ all speak of the great value of antipyrin in uterine colic, whether caused by drugs or otherwise. It relieves the pain without lessening the force of the uterine contractions. It may be given by mouth, enema, or hypodermically. Any depression it may cause is easily relieved by a little wine or other stimulant.

NON-PUERPERAL ACUTE METRITIS.

After calling attention to the fact that the occurrence of acute metritis aside from the puerperal state is denied by most eminent gynæcological authorities, Kerr⁸¹ reports a case which ended in death, but in which no autopsy was allowed. The symptoms were those which might have followed an early abortion, with subsequent metritis and sepsis. The girl had gone one week over her time, but Kerr thinks that the possibility of gravidity should be excluded because of the history and her respectable character. Brodnax,¹⁷⁶ who thinks that those who make the statement that "metritis does not occur in the virgin" are "only men, not gods," reports two cases in family connections, both virgins, where the disease was undoubted metritis, and manifested itself by fever, uterine enlargement, tenderness on pressure, and exudation of pus from the uterine cavity. Both cases recovered under treatment. He asks: "If metritis means inflammation of the womb, must the disease appear at a particular age, or only in women who have borne children? As well say that if the womb has not been impregnated, barring traumatisms, it cannot inflame." We agree in the truth of this last proposition, but regard acute metritis in the virgin as the rarest of all rare diseases.

PARA- AND PERI- METRITIS.

In discussing the treatment of acute pelvic cellulitis in the ANNUAL of 1888, we reported Hardon as having achieved excellent results in the stage of effusion by "aspiration, used in addition to the prolonged hot douche of Emmet." This is partly incorrect, as Hardon states that "the mechanical aspiration of the effused fluid removes the induration so quickly and completely that the cure is accomplished without the necessity of employing other

agents." The aspirator needle may be inserted to the depth of a half-inch at several points, using antiseptic precautions and care in avoiding any pulsating vessels. (See ANNUAL of 1888, p. 40.)

The treatment generally accepted for acute parametritis (cellulitis) following delivery or exposure to cold or traumatism is that of free purgation at the beginning of the attack, preferably by the old but recently revived method of small and repeated doses of magnesia sulphate; opiates only when the pain is very severe; the ice-bag over the abdomen so long as the temperature is high; hot poultices and hot vaginal douches when it has gone down. Aconite at the beginning used carefully to relieve arterial tension; antipyrin, antifebrin, or quinine for reduction of high temperatures. Should pus form, incision and drainage through vagina or abdomen as soon as fluctuation or signs of pointing are discovered. Rest, tonics, and nourishing food are all-important.

Pelvic abscess is divided by Thomas²⁷_{Oct} into three forms— inflammation of the cellular tissue between the layers of the broad ligament, between the vagina and posterior part of the uterus, and between the bladder and the uterus. Delbet⁷_{No. 16} distinguishes two forms—abscess between the layers of the broad ligament and abscess about the vessels at the base of the broad ligament.

The pelvic abscess may be simulated or complicated by many other conditions or neoplasms, of which the most frequent are diseased tubes, various pelvic cysts, hæmatocele, soft myomata, or other solid or semisolid tumors, displacements with adhesions, normal or extrauterine pregnancy, etc. A diagnostic sign which we have found very reliable and constant is the fact that with a pelvic abscess resulting from cellulitis it and the uterus are almost invariably perfectly immovable, while in the other simulating conditions the uterus may usually be moved slightly in a vertical plane. Hunter,⁵⁰_{June 16} in view of the difficulties often surrounding the diagnosis in these cases, says: "The surgical maxim that pus, wherever it exists, should be evacuated, does not invariably apply to cases of pelvic abscess; sometimes the danger of surgery is greater than the danger of waiting; there is no class of cases where good judgment is more imperatively required. The cases should be carefully watched, as they often undergo rather sudden changes. An anæsthetic should be given, if necessary, to secure satisfactory examination. When evacuation is decided upon the

vaginal incision is usually the best. This is made by cutting by the side of an exploring needle, avoiding the neighborhood of the larger vessels, then introducing a branched uterine dilator and enlarging the opening enough to admit the finger, which can then explore the cavity and break down any partitions between the pus-cavities. A soft-rubber drainage tube is then introduced and held in place by a couple of stitches to the edge of the wound, and frequent antiseptic irrigation is practiced. Or, the cavity may be packed with iodoform gauze, which must be frequently renewed. The operator must always be prepared for any possible emergencies, arising from hæmorrhage, error in diagnosis, etc.

Parish²⁷_{Oct.} is much in favor of the early evacuation of abscesses of the pelvic areolar tissue, and where an opening *per vaginam* cannot be safely effected he makes first an exploratory median laparotomy to determine whether or not pyosalpinx or ovarian abscess may co-exist. Finding these conditions absent, he then, with two fingers within the peritoneal cavity acting as guides, makes a second incision, usually just above the median portion of Poupart's ligament. This incision is carried deep into the pelvis, external to the peritoneum, until the small pus-cavity is reached. This is emptied, washed with a bichloride solution, and a drainage tube introduced. The median incision, which has been carefully protected, is closed and covered with an impermeable dressing. All the cases thus operated upon by him have made speedy recoveries. A possible danger from the presence of the drainage tube in these operations is illustrated in a case reported by Hubbard,⁹⁹_{June 7} where, after the extraperitoneal evacuation of the pus, the patient did well until the fourteenth day, when she died from a rupture of the external iliac artery, in consequence of ulceration caused by the pressure of the tube.

Paine²¹⁶_{Mar.} reports two cases of aggravated pelvic abscess between the vaginal wall and rectum, which had been abandoned by other physicians, where he accomplished a cure by passing an elastic ligature from the vagina through a portion of the abscess-cavity and then allowing it to slowly cut its way out, the parts, in the meanwhile, being kept clean by frequent vaginal douching.

Chronic parametritis is considered by Poulet¹⁶²_{June 25} to be perpetuated in many instances by the accompanying endometritis, after the cure of which by dilatation and curettage the parametric

inflammation rapidly disappears. He has treated in this manner more than fifty women having parametric inflammation in various stages of acuteness, and cure has resulted in all rapidly and without significant reactionary symptoms. In eight of these cases where the uterus was retroflexed and adherent it was forcibly replaced on the sound at the time of the curetting. To secure dilatation he employs a laminaria tent placed in the centre of a larger one, softened by boiling in a sublimate solution. In speaking of the strong opinions held by the profession against intrauterine manipulation while any parametric inflammation exists, he says: "I am absolutely convinced of the innocuity of this treatment when done with rigorous antiseptic precautions; accidents do not result from the traumatism to the uterus but from septic infection." In the opinion of the majority of the profession the French peritoneum must be less susceptible to inflammatory action than that of the women of other countries. Such practice as Poulet recommends may undoubtedly at times fail to excite inflammatory reaction, but such an escape must be looked upon as exceptionally fortunate both for operator and patient.

Gérard¹⁴⁰_{Sept.15} has obtained most excellent results in chronic parametritis by the use of the prolonged hot douche, using twenty quarts or more, as hot as can be borne, the irrigation lasting from forty-five minutes to one hour or longer, twice a day. This quickly relieves pain, then the various neuralgic symptoms, loss of appetite, etc. It revives the physical vigor, regulates menstruation, and causes rapid absorption of the exudation; is useful in all forms of parametritis and acts by regulating the circulation, diminishing stasis, and so favoring absorption.

Vineberg¹_{Jan.28} strongly advocates the internal administration of mercuric bichloride as an adjunct to the local treatment of obscure circumuterine inflammations, claiming that it will often do more to lessen the pains and other symptoms than the most approved local treatment. The drug is given for its resolvent effect, and therefore in small doses and for some weeks. Vineberg has used it in some thirty cases with most beneficial results. Chéron³⁵_{Jan.26} has used chloride of ammonium in similar cases with good results, giving from one-half to three grains (0.032 to 0.2 gramme) in sweetened water three times a day after meals.

Emmet¹_{Feb.15} and Dudley¹_{Aug.11} call attention to the importance of

recognizing and treating varicose conditions of the veins of the broad ligaments. Their results agree closely with those of Hardon²⁰⁷₁₈₈₇ who has stated that chronic pelvic cellulitis rarely, if ever, exists except as a sequence of a previous acute cellulitis; while hardness and tenderness in the broad ligaments as a result of pelvic venous engorgement are commonly mistaken for chronic pelvic cellulitis. The treatment of such engorgement, by raising the womb in the pelvis by suitable tamponade, relieves the constitutional as well as the local symptoms and places the patient in a suitable condition for a radical operation more speedily than by any other method commonly in use.

PSEUDOMYXOMA OF THE PERITONEUM.

A case of this rare disease is recorded by Geyl,⁹⁵_{Bd. 31, H. 2} where, after an explorative laparotomy, eight quarts of a thick, semifluid, light-yellow mass were removed and the peritoneal cavity cleaned as well as possible. A thin, dirty-gray deposit remained over everything. There was also a thin-walled, multilocular, glandular cyst of the ovary removed. The patient recovered rapidly from the operation, but died later of marasmus.

ACUTE PERITONITIS.

Tait¹⁴_{May 20} reports eight cases of acute peritonitis treated by laparotomy and drainage after thorough cleaning of the abdominal cavity. Six cases recovered, of which two were pregnant at the time of operation and went safely on to term. The two that died were moribund from delay. He pleads for early operation, particularly in primiparae, and believes that many lives otherwise doomed can and will be saved by the procedure. Montgomery²⁷_{Oct} recommends early operation where there is a purulent effusion in perforative peritonitis and in inflammations about the caecum. In the latter classes haste is particularly necessary, as more than a third die within three days. To prevent coils of intestines becoming adherent, Greig Smith suggests that they be kept floating for a few days after the operation in a warm, non-irritant, weak antiseptic solution; this end is secured by Penrose by continuous irrigation. Dunet,²³⁰_{June} Podrez,⁴⁹_{May} Meyers,²⁷_{Oct.} Boldt,²⁷_{Apr.} Eastman,²⁷_{Sept.} McMurtry,¹³⁹_{Oct.} Cushing,²⁷_{Oct.} Sutton,²⁷_{Oct.} Rickett,²⁷_{Oct.} and Opie²⁷_{Oct.} have all declared in favor of operative treatment. Chambers,¹_{Feb. 18} in the

"septic peritonitis" which sometimes follows after laparotomy, advocates opening the wound and washing out the peritoneum with clean hot water.

TUBERCULAR PERITONITIS.

The treatment of peritoneal tuberculosis by laparotomy has in certain cases been followed by such brilliant results that the profession have been inclined to accept the indication almost unconditionally. Pribram,³¹⁷_{June 2} however, warns against a too optimistic view of the procedure, and believes that the indications for such operations should be very carefully considered, that laparotomy should not be done if there be serious systemic infection, and that in mild cases medical treatment should be employed for a month, after which incision may be tried if necessary. On the other hand, Trzebieky,⁹_{July 14} from a study of fifty-four cases, of which forty were cured, and Kümmell,²_{July 7} who has collected forty cases, of which thirty-five remained healthy, considering the futility of therapeutical measures and the favorable results obtained by operation, consider that there is no longer any justification for expectant treatment, and that laparotomy and thorough evacuation of the fluid is indicated in every case where it is possible to recognize the affection. The diagnosis is difficult, has most frequently not been made, and is seldom certain before operation. In most of the cases noted the laparotomy has been done as an exploratory incision or for the relief of a supposed ovarian cyst or abdominal tumor. The objective signs are usually those of an encapsulated ascites. Considering the conditions under which a cure has been accomplished, we find that, though there are isolated cases reported of recovery after aspiration or tapping, much the best results have been achieved by a thorough evacuation of the ascitic fluid after laparotomy. Various measures of irrigation and disinfection have been employed, all with about the same results, so that we are led to believe that the one thing of prime importance is the *thorough* removal of the fluid and not the way in which it is done. Why a simple incision and drainage causes the disappearance or arrest of the tubercular disease is, as yet, an unsolved problem, though Fehling²⁷_{June} attributes the results to the change of pressure in the abdomen and the contact of extraneous germs with the bacillus tuberculosis. He also thinks the disease is secondary to a tuberculosis of the Fallopian tubes in the great majority of instances.

OPERATIONS FOR TUBERCULAR PERITONITIS REPORTED DURING 1888.

Operator.	Where Reported.	No. of Cases.	Remarks.
Trzebiecky . . .	Wien. Med. Woch., Nos. 6 and 7 .	3	Not previously diagnosed; all recovered.
Vander Warker .	Brit. Gyn. Jour., Feb.	1	Cured.
Elliot	Boston Med. and Sur. Jour., May 17	1	Diagnosis made before operation; cure.
Cabot	Boston Med. and Sur. Jour., Aug. 9	2	First case, diagnosis not made; cure; lost sight of after six months. Second case, youngest on record (three years) where diagnosis was made before operation; cured.
Fehling	Am. Jour. Obst., Jan.	3	Diagnosis previous to operation in 2; both cured.
McMurtry . . .	Annals of Gyn., Sept.	2	Both probably cured.
Montgomery . .	Am. Jour. Obst., Oct.	1	Cured. Diagnosis not made.
Marcy	Am. Jour. Obst., Oct.	1	Cured. Diagnosis not made.
Clark	Am. Jour. Obst., Oct.	1	Cured. Diagnosis not made.
E. W. Cushing .	Annals of Gyn., Sept.	1	Cured.
C. Cushing . . .	Pacific Med. and Surg. Journal, Oct.	1	Relieved for a time.
		17	Thirteen cured. Diagnosis made before operation in four.

LEUCORRHOEA.

To be successful in the treatment of the various forms of vaginal fluxes it is necessary to recognize the fact that they may have their origin in a diseased endometrium as well as from an inflamed or hyperæmic vaginal mucosa. In the first class it is necessary to cure the endometritis or other lesion which may be present; in the second, local applications to the vagina, with the necessary tonic or hygienic measures, will succeed.

Alexander¹²⁹_{May} and Stollard¹⁹_{May 12} confirm the favorable results obtained by Schwartz, who treats acute or chronic vaginitis by first irrigating the vagina with warm water and drying with sponges and absorbent cotton, then packing the upper vagina with coarsely powdered boric acid, which is held in place by a wad of absorbent salicylic wool. This is left in place four days, and repeated once or more, as may be necessary.

Chéron¹⁵⁴_{June} advises:—

R Potassii chloratis, 53 (11.67 grammes).
Tr. opii, 53 (11.67 grammes).
Aq. picis liq. 58 (248.8 grammes).

M. Sig. : Two to three tablespoonfuls to a quart of warm water, to be injected night and morning.

Verrier¹²²_{Feb} recommends for the pruritus accompanying leucorrhœa, cleanliness and dusting with powdered starch. If persistent, a lotion of carbolic acid, nine minims (0.58 gramme); acetate of

morphia, seven grains (0.45 gramme); dil. hydrocyanic acid, fifty minims (3.24 grammes); glycerine, three drachms (11.67 grammes); water, four ounces (124.4 grammes); is applied on a cotton tampon held between the vulvar lips by a bandage.

Fränkel³¹⁷_{Sept. 15} advocates the injection of a weak solution of zinc chloride, and reports good results from its use.

Johnson¹⁹_{May 12} calls attention to the highly contagious nature of the leucorrhœa of children. This is usually caused by a vulvar inflammation which rarely extends above the hymen. The treatment for the vulvar form is absolute cleanliness and partial rest. The external genitals should be carefully washed at least four times in the twenty-four hours with a solution of borax or boric acid, and after each washing a cotton pledget with vaseline and boracic acid inserted between the labia (Jackson¹⁹_{July 14}). This will usually relieve the trouble in a few days. In the more persistent forms where the disease extends above the hymen into the vagina, Johnson relies upon the local application of balsam of copaiba. After each washing he directs three or four drops of the copaiba to be dropped into the mouth of vagina and allowed to remain there and to diffuse itself over the various parts of the vulva. The dropping of the copaiba into the vagina should be conducted while the child is lying upon its back, with its hips elevated by a pillow, and the labia majora separated as widely as possible; and the child should be allowed to remain in this position for five or ten minutes after the application of the copaiba. Should the pure copaiba excite too much irritation, it may be mollified by mixing with equal portions of cocoa-butter or carbolized vaseline, and put into the vagina with a camel's hair brush as far as is practicable. While the local treatment is in progress, he prescribes the following as a tonic and alterative:—

R Sulphate of magnesia,	. . . . .	℥ 1 (31. grammes).
Caraway-water,	. . . . .	℥ 8 (248.8 grammes).
Iodide of potassium,	. . . . .	℥ 2 (7.78 grammes).
Fowler's solution,	. . . . .	℥ 1 (3.89 grammes).

M. S. : Shake well and give one teaspoonful to a tablespoonful, three times a day, according to the age of the child.

When severe pain in micturition attends the discharge, it will be found to be caused by fine inflamed points of mucous membrane situated about the orifice of the urethra, and these projecting points are most quickly destroyed by the application, once in every two

or three days, of nitrate of silver. During treatment the child should not be allowed to go to school, and should be restricted in its usual exercise. Indeed, the less exercise the child is allowed to take, the sooner will a cure be attained; and this fact should be impressed upon the mind of the mother; and she should also be informed that the treatment should be continued in no less a rigid manner for several weeks after the discharge has disappeared; for if this rule is not observed the discharge will most certainly return after its apparent disappearance. The diet should be generous and nutritious, while those articles of food apt to irritate the alimentary canal should be strictly forbidden.

NEUROSES.

Modern gynecology comprehends the study of the whole organism of woman. Her psychoneural functions are so intimately related with her gynæcic functions that it is not possible to intelligently study many of the diseases of the one without considering the influences of the other (Hughes, ⁹⁸Apr.).

Grace Peckham, ⁵⁹Feb. 18, from a study of two thousand gynæcic cases, of which five hundred and seventeen manifested nervous symptoms, comes to the following conclusions: Nervous disturbance outside of the pelvis is not nearly so frequent in disease of the uterus and its appendages as is generally believed. The amount of disturbance is in every way proportioned to the amount of uterine tissue involved and the length of time the disease has continued. The reflex nervous symptoms are no more severe or extensive than arise from displacements and inflammatory conditions of the uterus and its appendages than would be produced by pathological conditions of the same extent and chronic character in other parts of the body. When present they are usually the result of a previously inherited or acquired neurotic tendency. Eye trouble attributed to a uterine neurosis is generally due to anæmia and general asthenia. Many nervous symptoms are due to the constipation and anæmia with which uterine disease is so often accompanied. Nervous disturbances outside of the pelvis are much more prevalent among highly organized women of the higher classes than among those of the lower. Sacral neuralgia may often simulate uterine disease. No remedy addressed to the nervous system can compare with the bromide of potassium,

which certainly has a direct effect upon pelvic inflammation aside from the soothing of the nervous system; it should be combined with a bitter tonic. For general nervousness and hysteria a mixture of equal parts of valerian, spirit. ammon. aromat. and spir. lavend. comp., gives the best results. Pills of hyoseyamus and camphor are also valuable. Galvanism will often allay pelvic or general pains.

Attention has been called to the neuroses which may follow gynæcological operations by Werth, ³⁴_{June 5} who noted six instances out of three hundred operations upon the genital tract, by Ill, ¹⁶¹_{Jan.} who records ten cases, and by Championnière, ¹⁶²_{June 25} who speaks particularly of *crachotement*. The psychoses may arise after the most insignificant operation and usually take the form of a more or less pronounced melancholia. This may last from two to six or eight weeks and usually develops within two weeks of the operation. Ahlfeld saw a case where a marked melancholia followed the use of the speculum, and we have seen the same thing after a single digital examination. Crachotement is an important reflex which may follow operations upon the utero-ovarian apparatus; patients describe it by saying that they have an urgent desire to spit but are unable to do so. The symptom has rather a bad prognostic import; it may occur when the pulse and temperature are normal and may forecast nausea and vomiting. With it may be associated a tendency to syncope, a sensation of suffocation, a small pulse, anxiety, insomnia, and a pronounced inclination to weep.

Concerning the neuroses which may accompany menstruation but little has been said. Muller ²²⁰_{Mar. 10} notes some of the peculiarities of uterine cough, a paroxysmal reflex cough which may occur not only during menstruation, but with nearly all uterine or ovarian lesions save malignant neoplasms. It is common during pregnancy, and is in some women excited by the sexual relation. It is best relieved by quinine and potassium bromide given in connection with the necessary local treatment. Borner ⁸⁴_{July 12} calls attention to the localized, transient swellings of the skin, especially of the face, which are sometimes met with during menstruation or at the menopause. These swellings are strikingly like urticaria or, occasionally, erysipelas. They may be diffused over the whole body, as well as the face, and disappear of themselves at the close of the period.

In climacteric cases which complain of a "feeling of suffocation with pericardial distress," Bower¹⁸⁶_{Feb.} obtains complete relief by thirty-drop doses of the fluid extract of quebracho.

ECHINOCOCCUS OF THE UTERUS.

Elischer²²_{Jan.} had an interesting case where a woman of twenty-five had recently aborted three times in a little more than three months, she attributing her trouble to the presence of a tumor which she had noticed for something over two years. This tumor was diagnosed as a fibromyoma of the posterior uterine wall, and laparotomy was done for its removal; it was found, however, to be an echinococcus cyst of the uterine parenchyma, three hundred and twenty daughter cysts escaping on puncture. It could not be removed and was treated by sewing the cyst-walls to the abdominal wound, with drainage and daily irrigation. The patient did well. The cyst filled the cavity of Douglass and was universally adherent; the seat of the echinococcus, however, was subperitoneal, which became evident by the severe hæmorrhage of the uterine parenchyma when attempts at enucleation were made. The presence of echinococci in the genitals is exceedingly rare, Elischer stating that this is the first recorded case affecting the uterine tissue. The cases of Spencer Wells, Geissel, Schurenberg, Witzel, Slavjansky, and Freund were of echinococcus in the abdominal cavity. Only those of Thornton and Olshausen are to be looked upon as echinococci of the genitals. In the case of Olshausen the echinococci adhered to the uterus by means of a membrane. Prognosis in these cases is serious, as the cysts very rarely disappear or diminish in size without operative treatment.

DESTRUCTIVE PROLIFERATION OF RETAINED MYXOMATOUS CHORIONIC VILLI.

Meyer⁹⁵_{1833, 11} reports a unique case. The patient had been delivered of a hydatiform mole nine months before her death, which was caused by a progressive constitutional dyscrasia. The uterus was enlarged and infiltrated with a new growth, which a careful microscopical examination by Klebs showed to be a proliferation into the lymph-channels of the degenerated chorionic villi remaining after the molar pregnancy. These had extended through the uterine tissues and exhibited the characteristics of papillary epithelioma.

THE UTERINE MANIFESTATIONS OF MARSH MIASM.

Lardier³³_{Jan} calls particular attention to the occurrence of periodical metrorrhagias in those suffering from severe malarial poisoning. He also notes an increased tendency to all forms of uterine hæmorrhage and to abortion. The poison is very apt to manifest itself after labor, when it may be mistaken for septicæmia. It is necessary to recognize the malarial element in these various troubles, as success in their treatment can be best secured by the administration of large doses of quinine.

NEW METHODS IN GYNÆCOLOGICAL EXAMINATION.

Mendes de Leon,³¹⁷_{No. 21} in cases where the bimanual examination is difficult or unsatisfactory, finds great advantage in placing the

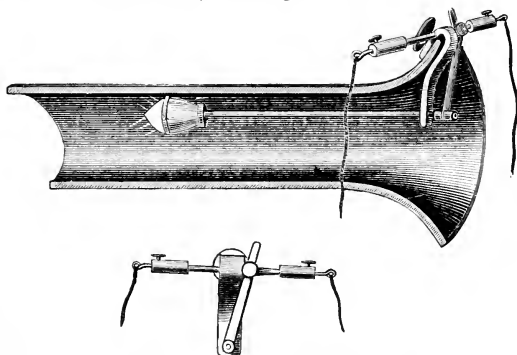


FIG. 7.—FÜRST ELECTRIC-LIGHT SPECULUM.
(*Deutsche Medicinische Wochenschrift.*)

patient with the pelvis elevated and flexed on the trunk. In this position she is unable to use the abdominal muscles and the whole pelvic contents can be mapped out with great ease.

Ullman⁵_{June} finds that the uterus and ovaries can be much more easily palpated when the rectum is distended with a colpeurynter. They are then lifted upward and forward and easily fall within reach of the palpating fingers.

NEW INSTRUMENTS.

Fürst⁶⁹_{Apr. 19} described a self-retaining speculum, to which is attached a self-retaining electric light, which he claims possesses special advantages.

The modification of Martin's speculum shown in Fig. 8 has the advantages of construction found in the original, with the improvement of having the handle made of a tube, with a hook at the end, on which a small pail may be hung to catch



FIG. 8.—JONES-MARTIN SPECULUM.
(*Medical and Surgical Reporter*.)

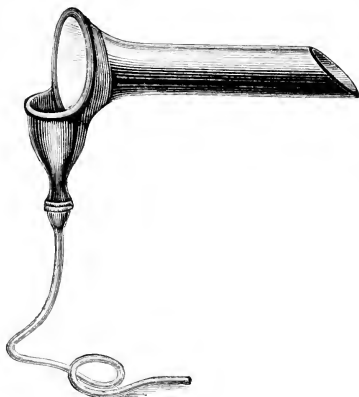


FIG. 9.—POZZI'S IRRIGATION ATTACHMENT.
(*Gazette de Gynécologie*.)

the drainage. This makes the operation more cleanly, and the weight of water furnishes a certain amount of traction, and holds the speculum in place without an assistant.

Pozzi¹⁵⁴_{Apr. 10} has invented an attachment carrying out the same idea, but which may be connected with any speculum by means of the rubber band shown above the dipper in Fig. 9.

Olivier⁷³_{Aug. 4} introduced an ingenious modification of the ordinary intrauterine sound, facilitating the free exit of fluid and rendering thorough cleansing possible.



FIG. 10.—OLIVIER'S IRRIGATING CATHETER.
(*Le Progrès Médical*.)

Howard A. Kelly presented an aseptic two-way catheter, a modification of Bozeman's, which will conduct and discharge water and solutions with the utmost freedom, and at the same time allow of perfect and ready cleansing after use. When the instrument, which will readily be understood by referring to Fig. 11, is in use,

water flies with force from the holes at the end, washes with it *débris* and fluid, which enter at once the large fenestra on the

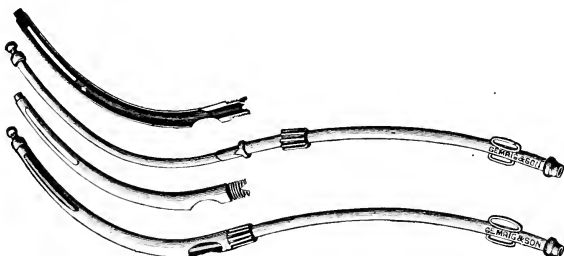


FIG. 11.—KELLY'S MODIFICATION OF BOZEMAN'S TWO-WAY CATHETER.



FIG. 12.—KELLY'S TENACULUM.
(*New York Medical Journal.*)

sides, and are washed down and out of this large hole into the receptacle. When out of use the cap is unscrewed, the halves fall apart,



FIG. 13.—RAINAL'S POWDER-BLOWER.
(*Gazette de Gynécologie.*)

and every part which has come in contact with infection is at once exposed and readily cleaned. The interior ought to be as highly

polished as the exterior. Dr. Kelly also presented the knife-blade tenaculum for scarification of the cervix, shown in the adjoining figure, p. 65.

Rainal¹⁵⁴_{Apr. 15} introduced the vaginal powder-blower shown in Fig. 13, which presents the advantage of requiring but one hand in its use, while ejecting the powder in a diffuse and impalpable form.

Hanks²⁷_{Jan.} presented to the Obstetrical Society of New York a new trachelorrhaphy scissors, a cut of which is here reproduced.



FIG. 14.—HANK'S TRACHELORRHAPHY SCISSORS.
(*American Journal of Obstetrics.*)

A lozenge-shaped indenture being made in each blade, the tissues are prevented from slipping out of their grasp when section is

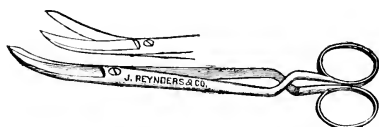


FIG. 15.—BOLDT'S TRACHELORRHAPHY SCISSORS.
(*American Journal of Obstetrics.*)

made. Another instrument for the same purpose was introduced by Boldt.²⁷_{Apr.}

DISEASES OF THE OVARIES AND TUBES.

By WILLIAM GOODELL, M.D.,

AND

W. CONSTANTINE GOODELL, M.D.,

PHILADELPHIA.

OVARITIS.

Pathological Anatomy.—Nagel, ³¹⁷_{May 26} from an examination of specimens from ovaries removed by Gusserow, believes that chronic oöphoritis cannot be divided into chronic follicular and chronic interstitial varieties. What is commonly known as chronic oöphoritis is the so-called chronic interstitial variety. It always begins with disease of the interstitial tissue, the Graafian follicles lose their normal appearance, and there follows an inability on the part of the ovary to discharge ova which are susceptible of fructification, until finally the follicles are destroyed. The most frequent cause of this disease is circumscribed peritonitis. The peripheral portions of the ovaries are first involved, the disease gradually affecting the deeper structure. Seldom has proof been found that the disease begins as acute interstitial oöphoritis. The so-called chronic follicular oöphoritis, or small, cystic, follicular degeneration of the ovaries, is a physiological condition. It is neither an inflammation of the ovary nor the beginning of a cyst, but a condition in which there is an increase of the follicles containing perceptible, healthy ova, and which is not due to disease of the stroma of the ovary. In the so-called *hydrops folliculi* the follicle can never become larger than when it first assumed this condition; in other words, it cannot develop into a true cyst. It must be considered as a phenomenon secondary to disease of the ovarian tissue. The simple non-epithelial cysts usually, if not always, originate from cystic degeneration of the corpus luteum, and this is never followed by contraction and cicatrization. The corpus luteum is the product of a proliferation process which leads to a new formation in the ovarian tissue.

Petit ²⁵_{Aug. 20} believes that to the two principal forms of ovaritis—
(F-1)

suppurative and sclerotic—are related certain cystic formations, the most important of which are encysted abscesses, the so-called follicular cysts (serous, caseous, sanguineous), and they require to be carefully distinguished from neoplasms of the ovaries. It is admitted that abscesses are frequently connected with the puerperal condition, and it is probable that they begin in the follicles. He insists upon the fact that they may remain chronic for long periods of time, constituting latent sources of infection. As regards the follicular cysts properly so called (follicular dropsy of Rokitansky), they would appear to be primarily due, in the majority of cases, to morbid and repeated congestion of the ovaries, and to give rise to the interstitial inflammation rather than to be the result thereof. Hypergenesis of the cubical epithelium in successive attacks, too indolent to lead to its being shed, sclerosis of the follicle walls, degeneration of the epithelium, liquefaction of the products of retention by exudations, hæmorrhages—these are the phenomena which succeed each other and permit only a restricted development of the cysts. They may, nevertheless, exceed the size of the clenched fist.

Nagel⁹⁵_{B433,H.1} arrives at the conclusion that epithelial ingrowths of the ovary are directly due to chronic inflammation, and that they are to be regarded as the beginnings of epithelial neoplasms, especially cystomata.

On the surface of an ovary which has undergone interstitial changes there are seen various furrows, resulting from contraction of the fibrous stroma; the germinal epithelium normally covering the ovary dips down into these furrows, forming the epithelial tubes which were formerly supposed to be of fetal origin. If the edges of such a depression become adherent, a closed cavity, or pseudo-cyst, is formed, containing a fluid secreted by the lining epithelium. In every diseased ovary these small cysts are found just beneath the albuginea, and are mistaken for new-formed Graafian bodies, from which, however, they may be distinguished by noting the following points: 1. The pseudo-cysts are lined with a single layer of regular cubical epithelial cells, while the cells lining a Graafian vesicle are arranged in several layers; the latter also contains an ovum. 2. The cysts never have a proper wall; their cell-lining is directly in contact with the ovarian stroma, while the oviculus has a limiting membrane consisting of two distinct layers.

3. The ovisacs have a regular oval shape, while the cysts are irregular and have outgrowths, or secondary cysts.

Since the cell-tubes have no limiting membrane, there is nothing to prevent them from pushing their way deeply into the stroma and throwing out processes. There is no ground for supposing that these ingrowths are identical in character with Pflüger's tubes; in fact, the former are observed only in chronically diseased ovaries and never in the fetal gland. The writer having shown that the cell-processes described by him are identical with the ingrowths observed by Waldeyer, which represent the early stage of epithelial neoplasms, infers that the latter must have a similar origin, *i.e.*, they are due to chronic inflammation of the ovary.

Gottschalk⁹⁵_{Bd. 32, H. 2} calls attention to a cavernous degeneration of the ovaries presenting on microscopical examination a general angiomatic structure with a dilatation of the vessels of the uterine mucosa. This disease gives rise often to great metrorrhagia. He says that it is clearly impossible to recognize this condition before operation, since the ovaries are simply felt to be somewhat enlarged; however, it might be suspected in a case of persistent uterine hæmorrhage, in which the organ was of normal size, and the curette brought away no hypertrophied tissue, while a careful examination of the pelvis failed to disclose any other cause for the symptom. It should not be forgotten that menorrhagia is a symptom of oöphoritis, but the hæmorrhages are less profuse than those which attend telangiectasis of the ovaries, and in the latter condition the ovaries themselves, though enlarged, are not the seat of pain.

Gout of the ovaries is a disease which Mabboux, of Contrexéville, deems by no means rare. He and Roubaud¹⁵⁴_{Aug. 3} state that it is frequently met with by the physicians stationed at warm springs. Their conclusions are that during and after sexual life there may exist a gouty metritis, vaginitis, and vulvitis; that these attacks may accompany the monthly periods or not; that utero-ovarian gout demands the same medication as articular or visceral gout; that waters highly charged with sodium bicarbonate are the best for plethoric cases after the inflammatory stage has wholly passed; that the cold waters of lime sulphate, such as those of Caprera, Contrexéville, Martigny, and Vittel suit the

majority of cases and can be drunk even in subacute stages of inflammation.

Neuralgia of the Ovaries.—Everard,⁶_{Nov. 54} of Mons, says that this affection is usually accompanied by hysterical symptoms. The patients are, as a rule, young girls, and they complain generally of violent and frequent headaches, buzzing in the ears, exaggeration of the olfactory and gustatory senses, ocular troubles, loss of memory, anæsthesia and hyperæsthesia of various portions of the body, capricious appetite, bad digestion, irregular bowels, and cough more or less frequent, for which no reason can be found on examination of the chest. Everard has had great success in these cases by the use of Apostoli's bipolar rheophore, in which the two currents are separated by a thin piece of gutta-percha. This sound is introduced into the vaginal fornix or into the uterus itself.

Sexual Precocity.—The effect of tumors of the ovary in the young is often to cause a sexual precocity, such as large, firm breasts, long hair on the pubis, and the function of menstruation. R. Clement Lucas⁶_{May 5} gives such a condition in a child of seven with sarcoma of the ovary. Removal of the tumor caused a gradual recedence in the signs of puberty. After elaborate experiments performed by Kehrer⁹⁷_{Dec. '91} on two or three months' old rabbits, he is led to the following conclusions in consonance with other experiences:—

1. That after removing *one* ovary in youthful animals, the remaining genitals, including lacteal glands, continue to develop quite regularly in size and symmetry. 2. That after complete removal of *both* ovaries in youthful animals, the genitals and lacteals do *not* continue to grow in proportion to the remainder of the body: they are permanently arrested at the stage of development reached at the time of castration, nor will they take up the functions corresponding with riper age.

Another series of experiments, relating to the question, whether the removal of both ovaries as such, or the disturbance caused by the operation in the conveyance of blood to the uterus, acted as an obstacle to its ulterior growth, resulted in the following fact: suspension of the conveyance of blood from the spermatie arteries to the *areus uterinus*—performed in youthful animals—in no way disturbs the normal development of the genitals, especially maturation and disruption of the follicles.

SALPINGITIS.

Pathological Anatomy.—The inflammatory processes occurring in the Fallopian tubes have been divided by H. J. Boldt^{27 Feb.} into catarrhal salpingitis and interstitial salpingitis. He says: "Inflammation of the tubes is, according to my personal observation, never a primary disease; usually it is transmitted from the uterus. The inflammation may invade only the mucosa of the tube or the whole of its wall. In the first instance, it may be catarrhal or purulent, varying in degree from a slight change of the columnar epithelia and the subjacent connective tissue up to a considerable infiltration of this tissue, combined with a profuse new formation of pus-corpuscles from the epithelia. In the second instance, the inflammation is interstitial, first invading the connective tissue between the muscle-bundles, again varying in depth and intensity from a slight inflammation to a partial destruction of the walls by suppuration."

It is impossible to draw an exact line of distinction between catarrhal and suppurative salpingitis of the mucosa, since the morbid changes differ only in degree, and very probably in the infective agent invading the epithelia.

In comparing salpingitis with urethritis, we find a difference only in the intensity of the process so far as the mucosa is concerned. A simple catarrh will not infrequently yield the same symptoms, the same combinations, and the same accompanying diseases in catarrhal as in gonorrhœic or purulent urethritis; nevertheless, we know that the infection in the first instance must have been entirely different from that in the second case. The amount of a purulent discharge may be the same in a severe catarrhal and in a mild gonorrhœic infection. Both may be confined to the mucosa and its epithelial cover. The sequelæ, however, are different, inasmuch as a simple catarrhal inflammation will rarely extend beyond the superficial layers of the mucosa, and consequently will pass away comparatively rapidly, whereas gonorrhœic inflammation often causes complete infiltration of the mucosa and the deeper portions of the interstitial connective tissue, leading to a partial destruction of the mucosa with subsequent cicatrization, or to a diffuse hyperplasia of the mucosa with narrowing of the passage, or at least its atrophy to a varying extent.

The diagnosis of catarrhal salpingitis can be established under

the microscope, when the epithelium is moderately swollen, with a slight augmentation of the nuclei and a vacuolation of the protoplasm. The latter feature seems to be especially characteristic, for it leads to the production of mucous corpuscles which are the offspring (of the protoplasm) of the epithelia themselves. The connective tissue building up the folds of the mucosa is in a condition of oedematous swelling or of slight infiltration with inflammatory corpuscles, the blood-vessels being at the same time dilated and filled with blood-corpuscles. These changes are never distributed uniformly in the mucosa, since unchanged folds may alternate with folds that show an inflammatory infiltration in their connective-tissue portions, but no changes in their epithelial cover and with folds markedly swelled and changed in all of their constituent tissues. Purulent inflammation will show the epithelia crowded with inflammatory corpuscles which, after being thrown to the outer surface, represent pus-corpuscles. Portions of the folds may be destitute of epithelia to a varying extent, though this appearance must be accepted with caution, as the mechanical injury done by the cutting instrument may have contributed toward the removal of covering epithelium. It is in the latter instance, viz.: in suppurative salpingitis, that a gonorrhœic or a septic infection is always the exciting cause. Obviously an intense catarrhal as well as a suppurative salpingitis may extend into the walls of the tube and thus become an interstitial salpingitis. It is also possible that a catarrhal salpingitis may quickly change into the purulent form by intense abrupt irritation; for instance, incautious injections of medicaments into the cavity of the uterus or incautious manual examination. In all instances we would consider the mucosa of the tube, the primary and the interstitial tissue of the muscular coat, as the secondary seat of the inflammation, though in cases of gonorrhœic and septicæmic infection in puerperio the disease may run such a rapid course that the first localization in the mucosa of the tube may not be traceable, both the superficial and deep inflammation appearing almost simultaneously."

Etiology.—It is not surprising that inflammatory conditions affecting the uterus should cause salpingitis, considering that the Fallopian tubes are developed structurally from the ducts of Müller, and that the arrangement of their constituent parts is identical with that which obtains in the uterus. Generally speaking, any

cause which will produce a diseased condition of the uterus would also produce salpingitis, such as abortion, especially when there has been incomplete evacuation of the contents of the uterus, followed by decomposition, inflammation, and sepsis. Scarletina, small-pox, and similar diseases may also cause it by the same process of extension and propagation. It also follows traumatism of the uterus and atresia of the vagina or of the uterus, with the retention of the products of menstruation. This should make us especially careful in the use of intrauterine medication lest there be retention and decomposition of the injected material with a subsequent salpingitis. The production of pyosalpinx is most often due to gonorrhœa and sepsis, especially when it is consequent upon abortion or parturition at term. It is also often associated with fibroid tumors of the uterus. Closure of the tubes from a localized peritonitis following salpingitis is also a cause.

Pyosalpinx.—Lucas-Championnière⁷_{Jan.} presented a specimen of double pyosalpinx which he deemed the largest on record. On December 31st, under a mistaken diagnosis, he tapped the right tumor, removing one litre and a quarter of inspissated creamy pus. On January 9th laparotomy was performed, when one litre of an analogous fluid was removed from the left tube. The largest pus tube removed by Tait contained about one-half the quantity of the right tube. The right ovary could not be found, and the left was with such difficulty removed that some ovarian stroma was left in the pedicle. This was destroyed by the thermo-cautery, because he believes that incomplete extirpation is the cause of the recurrence of menstruation after double oöphorectomy.

Just Lucas-Championnière²⁴_{Mar. 11} exhibited a very large hydrosalpinx. The symptoms were difficulty in walking, as in locomotor ataxia, vesical paralysis, and irregular menstruation with a tendency to hæmorrhage. All these symptoms disappeared after the operation. Symptoms of locomotor ataxia, with complete loss of locomotion, caused by hydrosalpinx, are also described⁷_{Feb.} by Lucas-Championnière.

Papilloma of Tube and Ovary.—Alban Doran²_{Feb. 25} has called our attention to a rare specimen of papilloma of tube and ovary. In his case both tubes and ovaries were affected. There was no free fluid in the peritoneal cavity, and no papillomata were diffused beyond the cysts. The disease appeared to represent a

form of atrophy due to old chronic inflammation, resembling in this respect the most frequent form of tubo-ovarian cyst. He refers to two other cases in which papilloma of the tube constituting a distinct disease has been described.

Carcinoma of the Fallopian Tube.—Alluding to the fact that Kiwisch had found carcinoma of the tube only eighteen times in seventy-three cases of cancer of the uterus, and Dittrich only four cases out of ninety-four of general carcinomatous disease, Orthmann³¹⁷_{May 26} stated to the Berlin Gynaecological Society that his researches in the literature of the subject had yielded accurate descriptions of only thirteen cases, in nine of which the uterus and in four the ovaries were primarily affected. The medullary form of cancer is most common; it may originate in either the mucous, muscular, or serous coat of the tube. Papillomata of the tube (recently described by Doran) may readily be mistaken for malignant growths. Three cases of carcinoma tubæ occurring in Martin's clinic were described, in one of which the disease was primary. Orthmann concluded from this that primary cancer of the tube does occur, although in the great majority of cases it is secondary to disease of the uterus. In the discussion which followed, Ruge said that he had never seen a case of primary carcinoma tubæ; he was inclined to believe that disease of this duct is more often secondary to malignant affection of the ovaries than to cancer of the uterus. Winter recalled an interesting case of carcinoma of the ovary, in which the disease appeared to have spread by contiguity to the adherent abdominal end of the tube, the rest of the latter being perfectly healthy. Olshausen cited a case of double ovarian tumor, in which, after removal of the cysts, a mass as large as a hazel-nut was found in the left tube; microscopically it showed the structure of endothelioma. Olshausen thought that the distribution of the lymphatics explained the fact that the tubes share so rarely in malignant disease of the ovaries.

Treatment (Medical).—Very little can be said as to the medical treatment of disease of the appendages. It has been dogmatically stated that no treatment other than surgical can be of any relief, yet we are forced to admit that the treatment by drugs and local applications is usually unavailing, although this is due in part to the fact that we seldom see these cases early enough in the disease. The avoidance of sexual intercourse is of prime importance, especi-

ally when there is great dyspareunia. Applications of heat externally by poultices, turpentine stupes, or hot-water bags, or internally by vaginal irrigation of from one-half to a gallon of water as hot as can be borne, blisters over painful spots, depletion of the cervix uteri by the knife or vaginal tampons saturated in pure glycerine, or the use of both conjointly.

The administration of the bromides, especially in combination with hyoseyamus, saline purges, aconite, and veratrum to restrain the heart's action, especially at the menstrual periods, will all relieve troublesome symptoms. Vaginal massage, which consists in gently rocking the uterus and moving it carefully in all directions, together with abdominal massage, will be found of great importance. The use of pessaries and soft-rubber rings, when not painful, by stretching adhesions and giving more mobility are often useful. Cardiac stimulants and the various preparations of aloes should be avoided. Gentle galvanic currents with the positive electrode in the vagina will usually give some relief to symptoms upon which the whole future treatment should depend.

E. H. Grandin ⁵⁹_{Aug 25} advocates the employment of the galvanic current in cases of perimetritic inflammation not characterized by recurrent attacks of peritonitis or by the manifest physical signs of pyosalpinx. He has not found it necessary to employ currents of high intensity, but has had more satisfactory results from the use of weak currents of long duration. Galvanism should be used until all tenderness on pressure of the vaginal vault has disappeared, the positive pole being inserted in the vagina, with the negative pole placed on the abdomen and made to cover a large area. After the tenderness has disappeared, the faradic current should be used. The uterus should be supported by means of a tampon in the intervals between the sittings, which should be held every other day.

Treatment (Surgical).—Since the old theory of pelvic cellulitis, upon which many cases of salpingitis were supposed to hinge, has been exploded, operation is plainly a necessity. Hence, temporizing by local applications when the patient is suffering greatly and a pelvic examination has proved satisfactory is a foolish waste of time and unfair to the patient. The conditions known as pyosalpinx and hæmosalpinx are the ones in which operation is most frequently called for on account of the tendency of the pus and blood to

accumulate, but any condition affecting the health and happiness of the woman not remediable by any other means should be treated in the same manner.

Removal of the appendages when the disease is of tubercular origin is not absolutely necessary, nor is it in cases of interstitial salpingitis, with obliteration of the cavity of the tubes and great change in the tissues, where the results of the inflammation might end in resolution; still, the condition is such that temporizing is unwarrantable. Each case should be separately judged on its own merits. The question as to the removal of both tubes is of prime importance. Probably the better method is to remove both, especially if endometritis is associated with disease of one of the tubes. On the other hand, the removal of the apparently healthy tube is open to serious objection, for unless it is already infected it cannot become so after the source of the infection is removed.

It is also urged that removal of both appendages brings on an early climacteric, with its consequent comparative freedom from risks of perimetritis and parametritis.

The general indications for the removal of the appendages, as suggested by Reed¹⁸⁸¹_{Auc.} for diseases other than tumor, are as follow:—

1. In cases in which there is undoubted enlargement of the tubes, due to retention of fluid by a necessary occlusion of both ends of the tube with an accumulation of serum, blood, or pus. In such cases immediate operation should be advised, for not only are the appendages functionally useless, but a constant menace to the health and, indeed, life of the patient.

2. In cases in which the ovaries are tender and enlarged or displaced, and will not yield to a course of intelligent local and constitutional treatment for a period of time sufficient to give a fair trial. Such cases are often unsatisfactory, as the differential diagnosis between ovaries enlarged by simple congestion from dislocation and ovaries enlarged by commencing cystic disease is very difficult and often impossible. The pathological condition in these latter cases is generally sclerosis, from chronic inflammation of the external tunic of the ovary, causing retention and degeneration of the matured Graaffian follicles.

The constitutional treatment in all these cases should be a thorough trial of the mercurials, iodides, and other alteratives.

3. In cases of epilepsy, hystero-epilepsy, and of all grave nervous phenomena clearly traceable to the ovaries or tubes. It is in just such cases that grave gynæcological errors have been committed by a too great hurry to operate or by a mistaken diagnosis. The pathological conditions found in this class of cases are: (*a*) chronic ovaritis; (*b*) follicular degeneration of the ovary; (*c*) peri-ovaritis with adhesions of the organs to adjacent parts; (*d*) irreducible displacement of the ovary; (*e*) distention of the tube from accumulation; (*f*) interstitial salpingitis.

4. In cases where a uterine fibro-myoma, or an enlarged fibroid uterus, is present, which interferes with health or threatens life and where extirpation of the appendages is more easily practicable than supravaginal hysterectomy.

5. In cases of so-called "puerperal peritonitis," where the appendages are found gangrenous and the pelvis is filled with pus from a resulting purulent peritonitis. Such cases should always be operated upon within forty-eight hours, the peritoneal cavity well washed out, and tubes introduced for purposes of free irrigation.

Martin's method ²⁷_{May} of operating in high-seated abscesses involving the ovaries, tubes, and intestines is to perform abdominal section, make out the exact position of the exudate, and puncture through the vagina. By this method he avoids wounding the intestines and establishes a most effective drainage. The after-treatment is simple. Absolute rest is maintained. The wound is not washed out, and the drainage tube remains for months after the patient has gotten out of bed. The advantage of this continuous drainage over the method of abdominal drainage is obvious. Often it is impossible to get drainage through the abdomen, since these abscesses are often so far away that their walls cannot be stitched to the abdominal wound.

The senior editor would like to call attention to the fact that he has anticipated Martin in this mode of treating small pelvic abscesses which are seated high up. He has published one case ¹¹⁰⁵_{3d ed. p. 292} in which the abscess opening into the bladder, its walls were always collapsed. Abdominal section was therefore performed and the exact position of the abscess-cavity made out. Guided by the left hand in the abdominal cavity, he then made an opening into the abscess, *per vaginam*, into which a winged drainage tube was passed. The recovery was slow, but complete. He

recommends this treatment whenever the sac of the abscess is too small for its upper wall to be stitched to the abdominal wound.

Apostoli¹⁰⁸_{Mar. 15} relates a remarkable case of cure of a hydrosalpinx following galvano-puncture by means of a galvanic needle of steel not larger than a hypodermic needle passed into the tumor for a distance of one centimetre with a current of one hundred to one hundred and forty milliamperes for five minutes. Two applications only were made, one to each side, followed by a discharge of serous fluid with relief of symptoms and entire recovery of patient. Dr. Apostoli, in conclusion,²_{May 12} observes that:—

“1. In gynaecology fever and inflammation are not to be regarded as absolutely contra-indicating the methodical and proper application of the galvanic current.

“2. Inflammation of the uterus and of its appendages, when not in the stage of suppuration, may be advantageously treated by the galvanic current. This current, though admissible in the first stages of congestion and inflammation, I consider ought not to be used when suppuration exists, unless it be brought into action in the form of an electrical cauterization, for the purpose of making a safe and certain outlet for the matter through the vaginal wall.

“3. A galvano-caustic puncture is a valuable means by which we may gain two ends—first, to check the outbreak of inflammatory action or to stop its progress; secondly, to give an easy exit to a collection of fluid, by the falling of an eschar, in any case where the cavity containing such fluid is accessible through the upper part of the vaginal wall.

“4. Every inflammatory exudation presenting itself in the vaginal *cul-de-sac* may be treated by means of the galvano-puncture, except under the condition which I shall hereafter mention.

“5. This method may be easily and harmlessly employed for the treatment of certain cases of salpingitis and hydrosalpinx, on account of the close relation between the tumors and the vaginal wall.

“6. In making every galvano-puncture, all the rules which I have hitherto laid down concerning the seat of the puncture, its depth, the size of the trocar, the antiseptic precautions, the repose of the patient, etc., must be scrupulously observed.

“7. Two negative galvano-punctures, vaginal only, were sufficient in one case of hydrosalpinx to bring about very quickly an important anatomical change and complete symptomatic cure.”

Many question the justifiability of opening the abdominal cavity for the purpose of breaking up adhesions, binding down ovaries and tubes and preventing their normal function, without removing the appendages, although they may seem healthy in every respect. W. Gill Wylie²³_{Dec. '87} has had several cases in which the peritonitis had evidently resulted from extension of a metritis through the walls of the uterus, but had not affected the ovaries and tubes, as is generally the case, judging from the density of the adhesions and the peculiar indurated roughness of the peritoneum covering the fundus and the general enlargement and hardness of the organ. Under such conditions he believes it unnecessary to remove them, but simply to break up adhesions and to restore them, if possible, to their natural position by replacing a retroflexed fundus uteri when present.

Pretended Removal of the Ovaries.—The following operation was performed by Chiarloni¹⁵⁴_{June 1} on a very nervous and bed-ridden young woman, in whom amenorrhœa caused by fright had existed for six years. After she had been anaesthetized a shallow incision was made through the skin alone. The wound was closed by fine sutures and dressed antiseptically. On the third, fourth, and fifth days following the operation a free metrostaxis took place, analogous to that which comes on after the removal of both ovaries. Lumbar and pelvic pains were also complained of. The moral effects of this counterfeited operation were remarkable. The mental and physical condition of the woman was considerably improved. She was able in a few days to get out of bed.

Menstruation after the Removal of the Appendages.—Lucas-Championnière²¹_{Feb. 19} gives two curious facts. After advancing the opinion that this phenomenon is due to ovarian stroma left behind in the pedicle by the carelessness of the operator, he states that for dysmenorrhœa he operated two years before on a lady, aged thirty-nine, who menstruated regularly and actively. He removed both ovaries, but left the tubes untouched. Menstruation at once disappeared and has not returned. In the other case one ovary and both tubes were destroyed, and yet menstruation continued without interruption.

A very ingenious theory with regard to this matter is proposed by A. W. Johnstone,¹¹⁰⁶_{p. 281, '87} of Danville, Ky., who claims to have discovered the cause of the recurrence of menstruation after the

removal of the appendages. Where the nerve-centre lies which controls menstruation he does not know, for "it may be in the pelvic solar plexus, or in some other sympathetic plexus, or even still farther back in the spinal cord itself. But it is not the destruction of this centre that is necessary to the artificial change of life, but the cutting of its connection with the uterus." In studying the sympathetic plexus of the broad ligament he "found that, besides quite a large number of filaments which accompany the Fallopian tube and the uterine branch of the spermatic artery, there is one particularly large trunk which comes up at a very acute angle to the body from deep down in the base of the broad ligament and enters the uterine cornu just underneath the lumen of the Fallopian tube." This nerve lies so close to the body that if the operator does not strangle the broad ligament as close to the horn of the uterus as possible and extirpate the whole tube, he will be liable to miss it. This nerve, Johnstone believes, "is the track through which the endometrium receives its physiological order, and that section of this nerve does for the endometrium exactly what the section of the chorda tympani does for the sub-maxillary gland."

An interesting discussion on this question took place at a recent meeting ³¹⁷_{June 2} of the Leipzig Obstetrical Society. It was introduced by Hennig, who announced at the outset that he agreed entirely with Bischoff's theory of menstruation. So long as it was certain that no portion of either ovary or a supernumerary gland was left at the time of operation, a periodical discharge of blood from such patients must be regarded as abnormal. He was inclined to believe that a small portion of the cortex of one ovary, containing Graafian vesicles, might be included in the ligature.

In the subsequent discussion, Säger stated that out of forty cases of castration he had observed continuous periodical hæmorrhages in only two, in one of which the persistent flow was due to retro-displacement of the uterus; it ceased after hysterorrhaphy had been performed. The speaker concluded that when no other "focus of irritation" is present, persistent menstruation after castration can only be due to some disease of the uterus.

Zweifel cited a case of recurring hæmorrhage after double salpingo-oöphorectomy which eventually ceased spontaneously. He believed that the metrostaxis would always cease in time, and that

such would be found to be the after-history of most of the reported cases of persistent menstruation.

OVARIAN CYSTS.

Pathological Anatomy.—Alban Doran^{June 25} has given us an excellent *résumé* of a work by Poupinel on mixed ovarian tumors. He says that “Dr. Poupinel has found that ovarian cysts may exhibit every grade between the pure dermoid and the pure mucoid multilocular, or common ovarian cyst. These grades constitute what he terms ‘mixed ovarian tumors.’ The epithelial lining of the purest mucoid cyst is extremely variable; it may be cylindrical, cubical, goblet-celled, metatypical, or even ciliated. (He says nothing, throughout his paper, of papillomatous or hilum-cysts. Ciliated epithelium is strongly suggestive of an origin from the Wolffian tubules which are found in the hilum and which stray sparingly into the parenchyma in our species; hence, the occasional presence of papillomatous amidst mucoid or glandular cysts.) Sometimes the epithelium is mixed. In mixed ovarian tumors the epithelial lining of the cysts may be yet more varied, that is, cubical, goblet-celled, polymorphous, ciliated, stratified, or truly epidermic. In some cases the cyst is partly lined with skin-bearing hair and sebaceous and sudoriparous glands, partly with uniform or polymorphous epithelium. Lastly, in dermoid cysts the lining of the cyst is, as a rule, purely cutaneous. Sometimes it is mixed with what appears to be true mucous membrane. The stroma or inter-cystic material in multilocular cysts is, as a rule, entirely made up of young, perfect, or myxomatous connective tissue. Both bone and cartilage may develop in the stroma. In the mixed ovarian tumors osseous and enchondromatous deposits in the stroma are not so closely connected with the neighboring secondary cysts as are similar formations in pure dermoid tumors. Lastly, the stroma may contain plain or striated muscle-cells or nerve-tissue (teratoma of Virchow, Lebert’s third variety of ovarian cyst). All the above-named conditions may be bilateral. Brodowsky has found ciliated epithelium in a pair of ovarian cysts. On the other hand, one ovary may form a mixed cyst, the opposite a mucoid or dermoid cyst. Dermoid cysts may become cancerous or even sarcomatous (Unverricht) or colloid (Crucilhier).

“Thus Dr. Poupinel endeavors to establish, by demonstrating

gradations, the identity (in origin at least) of dermoid cysts and common ovarian multilocular tumors. The former are cysts lined internally with skin, which may bear epidermic appendages and glands, found in connection with normal skin. The common multilocular cyst is lined with what must be considered, to all intents and purposes, as mucous membrane, which secretes a mucoid fluid, and which may bear involutions representing glands. In other characters, Dr. Poupinel adds, the two varieties of tumor are similar. Thus mucoid cysts may give rise to so-called secondary deposits. Evidence has been brought forward to prove that dermoid cysts may do the same. Rupture of an ovarian cyst may cause dissemination of glandular growths or of secondary cysts, and in this respect the multilocular may resemble the dermoid ovarian tumor, for in both forms rupture may disseminate the intracystic growths; but whether true metastasis occurs in either is doubtful. Again, in both forms exogenous cysts, or secondary cysts which protrude from the main wall of the tumor, may become detached and adhere to omentum or intestine.

Dr. Poupinel finds, in accordance with previous authorities, that the mucous (or common multilocular) cysts are most frequent in adult life (from thirty-five to forty-five). The mixed forms appear between the ages of fifteen and twenty-five. All three types are said by Dr. Poupinel to be rare in childhood, but, relatively, dermoid tumors are then common. Indeed, nearly all the ovarian cysts which have been removed from patients under puberty have proved to be dermoid. In the fœtus, ovarian cysts may be papillomatous, or even malignant. Winckel figures in his text-book an adenomatous ovarian tumor, and simple follicular cysts are very common in the fœtus.

Dr. Poupinel rejects learned hypotheses on the origin of dermoid cysts. They are not more mysterious in their nature than common multilocular cysts; the former develop skin, the latter mucous membrane, and mucous membrane is as wonderful as cutis and epidermis."

The pathology of ovarian cystoma is of necessity somewhat obscure and the opinions in regard to their growth are numerous and perplexing. We are indebted to J. W. Martin³⁶_{Nov.} for the following:—

"Cystic tumors of the ovary are of two kinds—simple and

multiple. The simple or monothalamous are generally understood to be Graafian follicles distended with fluid (liquor folliculi) in a dropsical state, previous to rupture or after, and the ovum may be found with fluid, destroyed or healthy, the follicle being within the tissue of the ovary.

"A second form is the tubo-ovarian cyst, described in books as hydrops ovarium profluens, and both ovary and tube participate in its formation, the line of demarcation being seen on the cyst-walls. There is pigment observed on the walls formed by the ovary, the cyst being formed by the fimbriated end of the tube remaining attached to a ruptured follicle, and, secretion taking the place of blood, it grows into a cyst, though never attaining any considerable size.

"Another kind of cyst is the dermoid, long recognized by gynæcologists, which contains the elements of skin—together with its appendages, nails, hair, teeth, bones, and sebaceous matter poured out.

"Then follow the large ovarian cysts of the ovary of multiple growth. These are of two kinds, called respectively the papillomatous and glandular cystomata. The former is characterized by the growth of little papillomatous projections from the walls within the cyst, these covered by the large cylindrical epithelium. The other derives its name from the fact that the epithelium forms little follicular growths outward, and these, again, may proliferate. The contents of these cysts is a thick, glairy-like fluid or colloid material, which may be highly inspissated or in a fluid state. According to Doran,¹¹⁰⁷_{p.68} sessile cysts which arise from the hilum of the ovary or from the Wolffian relics in the broad ligament are usually papillomatous; but that non-papillomatous sessile cysts, infiltrating the broad ligament, are not infrequently met with. Lastly, cysts may be formed in connection with solid and malignant tumors, fibromata, and adenomata."

Parovarian Cysts.—Terrillon⁴⁸_{Feb.} states that there are two kinds of these cysts. The one has thin walls, which are smooth and without vegetations. The fluid is limpid and does not contain paralbumen. The other kind has thick walls, often studded with vegetations; the epithelium is that of ovarian cysts. The fluid may also be limpid, but it is often straw-colored or even of a deeper hue, and it always contains paralbumen. If tapped the cysts which do not contain paralbumen slowly refill, and are sometimes supposed

to be cured in this way. On the other hand, the cysts which contain paralbumen rapidly refill after tapping. Terrillon thinks that by time the one kind of cysts may be converted into the other.

Terrillon⁴⁰ has also written an able article on "The Recurrence of Parovarian Cysts after Simple Puncture."

In a rapid review of the subject, it was established that Panas' and S. Duplay's observations in support of the definite cure of these cysts by simple puncture referred to tests which had not been followed long enough. Koeberlé first, and then Lucas-Championnière, Terrier, and Polaillon maintained that simple puncture was most often only palliative, and that ovariectomy had to be resorted to. This was also Terrillon's opinion, and he supported it by seven observations of his own, and by the results of the *résumé* of observations published up to the present. In all his observations Terrillon, from the fluid analyzed, showed the characteristic composition, limpidity, little solid residue, and absence of free albumen.

Intraligamentary Cysts.—At an autopsy Delbert⁴¹_{Mar. 11} found a cyst as large as an orange, wholly included in the broad ligament. He was satisfied that it was of ovarian and not of parovarian origin for the following reasons: The ovary itself was found at one end of the growth, but it was much lessened in size, because the cyst had evidently grown at its expense. The cyst consisted of two unequal cells wholly separated from each other. Their contents were not limpid, like those of parovarian cysts, but dark. The ligament of the tube had not been penetrated and taken up by the tumor, as it always is in parovarian cysts before it burrows in that of the ovary, but it hung by itself. We think that a fifth reason might have been given, viz.: that the reporter could not detach the peritoneal covering of the cyst without tearing it. This shows that the peritoneal coat had been riveted to the cyst-wall by the cicatrices of ruptured ovisacs, thus proving an ovarian origin for the tumor. This case affords strong proof of Doran's theory, that intraligamentary cysts start from stray fetal relics in the hilum of the ovary.

Delbert's specimen showed another important fact, that these cysts have two vascular pedunculated supplies, an external one from the utero-ovarian artery, and an internal one from the cornu of the womb.

Dermoid Cysts.—Bland Sutton,⁴²_{Aug.} after a series of elaborate

investigations, has come to the conclusion that *ovarian dermoids, like oöphoritic cysts in general, originate in Graafian follicles.* The chief reasons may be summarized as follows:—

1. The localization of multilocular cysts and dermoids to the oöphoron. 2. The frequent association of a dermoid with a multilocular ovarian cyst. 3. The extreme frequency with which dermoids occur in the ovary can only be accounted for by some functional peculiarity. The only peculiarity it possesses in this respect is the formation of Graafian follicles. 4. Transitional stages can be traced from the membrana granulosa to mucous membrane, mucous glands, and teeth, on the one hand; to skin, glands, hair, teeth, and mammae, on the other.

It must be borne in mind that a distinction exists between dermoids occurring in such situations as the angle of the orbit, tongue, neck, etc., and ovarian dermoids. Finally, it is high time that some explanation should be offered to account for the origin of ovarian dermoids which shall be more satisfactory than such expressions as *fatus in fatu*, *pangenesi*s, *parthenogenesi*s, *excess of formative visus*, *hypererchesi*s, and other guesses equally vague and unsupported by facts.

Cyst of an Accessory Ovary.—Bassini, of Padua, ⁹¹_{June 10} reports a very interesting case of cyst of a supplementary ovary. It was enveloped by the mesentery and by the posterior leaf of the broad ligament. As the kidneys and the ovaries were intact, the operator was forced to believe that the cyst was one of the accessory ovaries so frequently found in the folds of the broad ligament.

French pathologists deem the intraligamentary ovarian cyst to be always a degeneration of these accessory ovarian bodies; but in our opinion ²⁷_{p. 1, Jan.} Doran has adduced very potent arguments in favor of its origin from the hilum of the ovary.

Calcification of Ovarian Cysts.—J. R. Nilsen ²⁷_{May} calls attention to the fact that calcification of an ovarian cyst is extremely rare, and then either the sac is calcified or it is studded with calcareous nodules. In fibroid tumors the calcification proceeds in lamellæ, and occasionally their capsules undergo degeneration.

Phantom Tumors of the Abdomen.—At the Medical Society of Lille ¹⁰⁰_{July 12} one of the members reported the case of a girl of twenty-four, in which many physicians had diagnosticated an ovarian tumor. She had complained for many months of pain in the left

flank, which was decidedly enlarged. Percussion revealed dullness from the navel to the hypogastrium and laterally as far as a line drawn vertically from the spines of the ilium. Palpation revealed an ovoid tumor occupying those regions. Chloroform being administered, every evidence of tumor disappeared, and the hand could readily feel the vertebral column. The reporter states that Tait cites twenty cases of phantom tumor in which the belly was opened, and that Terrillon insists on the inhalation of an anæsthetic in all cases of doubtful diagnosis. This curious counterfeit of a tumor occurs in hysterical women and in women who yearn to become mothers. Strangely enough, even mares and cows have been found to have phantom tumors, which disappear quickly after the natural term of gestation.

Solid Tumors of the Ovary.—In autopsies performed at the Medical University of Munich, Seeger³¹⁷_{Sept. 1} discovered four cases of fibroma of the ovary and four of sarcoma, one of them being round-celled, the other spindle-celled. There were also five solid carcinomatous tumors, of which two were double, one was accompanied by a dermoid cyst of the other ovary, and three were of mixed form, viz.: carcinoma sarcomatosum. Two of these were also double.

The above confirms the experience of the editors, who have found that the proportion of double malignant ovarian tumors to be a large one—so large, indeed, that the mere presence of two ovarian cysts in the same woman always arouses in their minds the suspicion of malignancy.

Treatment.—At a meeting of the Bucharest Society of Medicine, Professor Kalindero²⁸⁹_{Mar.} gave the history of a case of ovarian tumor in which a small quantity of serum was removed by a hypodermic syringe. This was followed by severe peritoneal symptoms, from which the patient died on the same day. At the autopsy the perforation in the cyst-wall was found to be as large as a fifty-centime piece, the peritoneal cavity contained the fluid of the sac, and a general peritonitis was manifest.

The Roumanian surgeons are evidently not up to the times, for at the same meeting another member of the Society, Dr. Stefanescu, also showed a still more remarkable lack of knowledge of the progress which laparotomy has made. He removed a large ovarian tumor without first reducing its size by wholly emptying it of its contents, consequently he had to make a correspondingly

large abdominal incision—viz.: from the symphysis pubis to a point three inches above the umbilicus. He then treated the pedicle extraperitoneally with the clamp. He next closed the abdominal wound with silver sutures and did not use a drainage tube, although the adhesions were firm and numerous. After the removal of the cyst it was found to contain ten litres of fluid. The operation lasted two hours, and fifty drachms of chloroform were used. Fortunately the patient recovered.

Vaginal Ovariectomy.—Although the removal of the ovaries and tubes *per vaginam* seems to be more and more a thing of the past, still, it has many warm supporters who advise this method of procedure where the uterus is freely movable or else retroverted. The operation is contraindicated when the cervix is held back or the fundus held forward by rigid tissues; also when the ovaries are bound by masses of lymph high up laterally or anteriorly in the pelvis; also when an ovarian tumor is larger than an orange and adherent, or larger than a child's head even if it is not adherent.

The operation is as follows: After thorough disinfection of the vagina and surrounding parts, the cervix is drawn down and a strong thread passed through it as a tractor; the cervix is now drawn forward, while the perineum is held back with a retractor; the posterior vaginal wall is seized a little below the vaginal junction to avoid hæmorrhage, and snipped through in the median line for an inch and a half. The peritoneal opening may be torn larger by the fingers if necessary. Excessive bleeding seldom occurs and can be controlled by forceps or ligature. Two fingers are introduced through the opening into the *cul-de-sac* and over the sacro-uterine ligament and the ovary seized; the tube usually follows. A needle is then passed through the broad ligament and the pedicle tied in two halves, the ligature being long, to allow of the knots being drawn tightly by the thumb or forefingers. Cysts should be punctured or aspirated when too large to pass readily through the opening. The *cul-de-sac* is now sponged out and a soft sponge on a holder left in to absorb any bloody oozing that may occur. Stitches are now introduced into the lips of the incision, including the peritoneal as well as the vaginal edge, and a drainage tube introduced into the lower angle of the wound if there is any need for it. Care should be taken to prevent vaginal discharges polluting the wound and entering the tube, and for this purpose a long

strip of iodoform gauze is introduced into the vagina around the tube with its end projecting so as to come in contact with a dry piece laid on the vulva to afford capillary drainage. Another piece is wrapped around the external end of the tube as an additional safeguard against sepsis. During the operation any adhesion which may be present, excepting those involving intestines, may be loosened with the same freedom as in abdominal section, hæmorrhage being checked by sponge or finger pressure, hæmostatic forceps, or ligature, by the application of ice, Monsell's solution, rectal tampons, or rectal and vaginal tampons combined. Hot water may be injected at a temperature of 120° F. (49° C.) with less danger from shock, since the intestines are less in the way, as are also the diaphragm and stomach. The drainage tube is removed after twenty-four hours unless contra-indicated. The tampon is left in from two to three days unless a rise in the temperature should supervene, which should be controlled by an ice-bag placed on the hypogastrium. The remainder of the treatment is similar to that of the abdominal method.

Byford²⁷ makes a strong plea for this method of operating and cites as advantages the following:—

"1. The ovaries and tubes, when they lie low in the pelvis, are reached with much less interference with the intestines; the shock and reaction are less, and in case of difficulty in separating adhesions the resulting inflammation is much less apt to spread to the abdominal cavity. 2. The wound is less in extent, is at the lower end of the abdominal cavity, is better situated for drainage, is concealed, and is less liable to be followed by hernia. 3. The bands of adhesion can in this class of cases be more often drawn into the field of vision and tied. 4. Hot water, ice, and other hæmostatic agents can be used with less danger. 5. Advantage can be taken of the temporary exudate in the *cul-de-sac* to fix the retroverted uterus in a normal position. 6. When much time is required there is much less of that danger which comes from leaving the abdominal cavity open a long time in abdominal section. 7. The statistics, other things being equal, are in favor of it, although it has been by some operators employed indiscriminately for all kinds of cases. In a series of twelve cases, selected according to the principles I have here advocated, it has given twelve recoveries—a series not long enough to establish any definite con-

clusions, but long enough to justify a further trial of a hastily abandoned operation.

“Objections.—1. It is objected to the operation that the abdominal method is simpler, quicker, and easier. This is not so in the cases for which vaginal section is indicated. It is, however, true of cases in which the cervix is held back and the ovaries high up or far forward in the pelvis. 2. Objection is made on account of the dilatation of the vagina—often necessary. No dilatation is necessary, except such as can be accomplished by the retractors. 3. Objection is made that one cannot see so well. I answer that one can, as a rule, see better in this kind of cases than by abdominal incision, except when there is a large incision and eventration. 4. That the stump cannot be so easily tied. This, again, is not true of those cases in which the organs are low in the pelvis. When there are extensive adhesions less mutilation is required to bring them into view and reach. 5. Difficulty attending antiseptis. This is only apparent. The method I have adopted of sewing up the wound around a drainage tube leaves only the external end of the tube to be protected. After thorough disinfection of the vagina and uterus, the iodoform and iodoform gauze are sufficient for the time that the tube need be left. If pus or other septic matter in the pelvic cavity require that the vaginal wound be left open the disinfected vagina will be comparatively harmless, particularly so until the peritoneal cavity becomes closed off above the purulent region.

“Dangers.—The chief danger would seem to be from sepsis, due to imperfect disinfection of the vagina; to escape of the contents either of a dermoid cyst or of suppurating ovary or tube, or to an adhesion after the operation of the posterior wall of the uterus to the sacro-uterine ligaments, so as to shut bloody or other exudates in the peritoneal cavity. Such disasters, as well as that of wounding the rectum, may, of course, be avoided by care and antiseptis.”

Washing out the Peritoneal Cavity.—Care should always be taken in washing out the peritoneal cavity, especially with so-called antiseptics, for even irrigation of the abdominal cavity with distilled water has led to serious results. Polaillon,²¹ during the irrigation of the pelvic cavity of a case of ovariectomy with a 1 per cent. solution of carbolic acid of a temperature of 37° C. (98.6° F.),

observed respiration become quickened, then arrested, the face becoming livid. The heart, however, continued to beat. Artificial respiration was practiced and tracheotomy performed, but all was unavailing. Polaillon believes that death was entirely due to washing out the peritoneal cavity, although some might be inclined to blame the chloroformist. Bantock, ²²_{Nov. 21} in referring to the case, believes that had plain water been used this serious result would not have happened. He thought that such a weak solution of carbolic acid might readily be absorbed by the peritoneum, where, had a stronger solution been used, the mouths of the lymphatics would have been sealed by its caustic effect. He refers to a case where hyperpyrexia followed within half an hour the application of a solution of carbolic acid to the arm. Guérin ²¹_{Aug. 12} recalls a case where in touching the diaphragm in a case of laparotomy the heart's action became weak and respiration ceased.

Drainage of the Peritoneum after Abdominal Section.—After trying various modes of drainage, both for the oozing of blood from denuded surfaces and for carrying off the septic secretions following incomplete extirpation of tumors, Pozzi ⁹¹_{Apr. 10} gives the palm to the plan of capillary drainage devised by Mikulicz. This consists in leaving within the abdominal cavity or in the unremoved cyst a bag of iodoform gauze, which is packed with pieces of the same material. Pozzi tried this plan in a case of intraligamentary cyst, in which raw and bleeding surfaces were left on the wound and in the pelvic structures. The last layer of gauze was removed on the sixth day. The convalescence was retarded by the persistence for two months of a fistulous tract at the drainage opening. In a second case of an analogous cyst the same kind of drainage was used. The gauze was wholly removed on the eighth day without the production of a single drop of pus. In a third case, one of gonorrhœal pyosalpinx, in which the abscess had emptied itself repeatedly by the rectum, the same kind of drainage was successfully used, although fecal matter issued from the wound on the third day. The advantages of Mikulicz's method, according to Pozzi, are that it fulfills the function of hæmostasis, of drainage, and of isolating septic surfaces from the general peritoneal cavity.

In the discussion which followed, Bouilly, Terrillon, and Terrier upheld the simple drainage tube of rubber, and maintained that the iodoform gauze demanded too dangerous a manipulation

and too large an opening in the wound for its withdrawal. In this opinion the editors heartily concur, believing that the field for drainage by packing iodoform gauze in some portion of the peritoneal cavity will be a very limited one. It perhaps may be adopted with advantage in the interior of cysts which are too adherent to be removed, or in abdominal and pelvic abscesses opened by laparotomy, as we have recently tried it, and very successfully. The danger of overdosing the patient with iodoform should not be forgotten.

When cysts are too adherent to be removed, Terrillon^{48 Feb.} passes one long rubber tube, with side-holes, from the abdominal wound through the floor of the pelvis, and out by the vagina. The upper end is cut flush with the skin surface of the wound and kept from slipping in by a safety-pin. It is covered with iodoform gauze. The lower end lies free in the vagina, but around it is packed loosely some iodoform gauze.

There is one objection to this mode of drainage, viz.: the danger of wounding one of the large pelvic vessels. This has been done once by Terrillon, repeatedly by others, and notably by Bardenheuer, with a fatal issue. The hæmorrhage in the successful cases was very difficult to arrest. In cases in which this danger is apprehended, Terrillon puts in a drainage tube from above, and packs it loosely with pellets of iodoform gauze. The latter is removed and replaced by new gauze every four or five days. After three or four such dressings the cyst-walls, through intestinal pressure, are brought in actual contact with one another.

Prognosis.—In cases of abdominal section as a means of assisting prognosis the temperature alone should not be considered, but the pulse should be regarded as the true index of the patient's condition. Gilliam avers^{59 Sept. 29} that a thermal excursion of from 4° to 6° F. is not infrequent after the operation, and should be regarded of itself as of comparative unimportance. If, however, the pulse be rapid and thready, the prognosis is effected accordingly. In fatal cases the pulse-rate progressively increases until, as Tait very aptly expresses it, it runs out. A pulse, however, that varies from time to time, now fast, now slow, is not suspicious, although a very rapid pulse, unless plainly of nervous origin, is always a source of anxiety.

Complications.—Cases are not uncommon in which from fusion

of the ovarian cyst with the womb the cervix uteri has to be converted into a pedicle and the corpus removed by supravaginal incision. Chenieux¹⁵⁴_{Feb.} reports such a case with a colloid cyst, which had burst several days before the operation. The cyst-wall was so intimately fused to the uterine fundus that he had to perform a supravaginal hysterectomy. This he did by grasping the cervix with two catch-forceps, tying it with catgut, amputating the corpus, and charring the raw surface with the actual cautery. The pedicle was dropped, and it does not appear that drainage was employed. The woman died on the beginning of the fourth day.

The editors have personally had one such case, but the pedicle was treated extraperitoneally, and the woman recovered. This complication is usually found in intraligamentary cysts, which, by separating the two layers of the broad ligament, denude the womb and bring the naked surface of the cyst-wall in direct contact with the naked uterine tissue, by which the one is fused, or soldered, to the other. Usually, by patient dissection, a pedicle can be made out of the cyst-wall or out of one uterine cornu. In our last case of intraligamentary cyst, the tumor weighing eighty-five pounds and being universally adherent, the left cornu of the womb was converted into a pedicle and dropped. The lady promptly recovered, but so much of the broad ligament was destroyed or removed by the enucleation of this cyst that the womb was left with very little support, and it remains a question with us whether supravaginal hysterectomy would not have been better.

Torsion of the Pedicle.—Torsion of the pedicle is not a rare occurrence. Out of six hundred cases Knowsley Thornton⁵_{Oct.} reports fifty-seven twisted pedicles. He believes that the chief influences which favor this condition are the function of menstruation, pregnancy, and the married condition, the peristaltic action of the bowels, and sudden changes in position. Irregularities of the surface of the tumor also favor rotation, and therefore in the fifty-seven twisted pedicles eleven were in dermoid cysts. The dangers following this condition are hæmorrhage from the rupture of blood-vessels and the development of peritonitis and sepsis. The diagnosis is made from the acute attacks of pain accompanied by fever, prostration and vomiting. Sometimes by the bimanual method the thickness of the pedicle can be diagnosticated. A rapid enlarge-

ment of the tumor also occurs, and rupture of the cyst-wall is known. If the twist is gradual the changes are less dangerous, the parts seeming to accommodate themselves to the new condition. Operative measures are best postponed until the acute inflammatory stage has passed, and this rule seems to hold good in all operations upon the abdominal cavity, no matter for what purpose.

Knowsley Thornton^{5 Oct.} does not believe that gangrene ever results from the twisting of an ovarian pedicle unless there is some element introduced from without to cause death of the tissues. He says:—

“Even in the cases in which sudden and complete obstruction of the arterial and venous circulation takes place gangrene does not follow, because the tumor is inclosed in that great lymph-sac, the peritoneum, and cut off from the external agencies which cause gangrene in a limb or external part under similar conditions of obstructed circulation. The tumor may be black and discolored and full of blood-clots, but it is not gangrenous or sloughing; its condition is one of acute inflammation, which rapidly spreads from its peritoneal covering to the other peritoneal surfaces in contact with it, and the peritonitis may be so severe as to cause the death of the patient; but to say that the tumor becomes gangrenous and kills the patient is contrary to all we know at the present day of the pathology of death of tissue in the living body. Blood-clot contains, in a marked degree, the vital elements which resist putrefactive changes and death, and its presence in large quantity in these rotated tumors is one of the greatest safeguards against their death, giving time for the re-establishment of the circulation through the rapidly adhering peritoneal surfaces.

“It is conceivable that in a patient with very little vitality or with a very depraved condition of the blood rapid growth of putrefactive organisms in the tumor might lead to real gangrene or sloughing, but no such case has yet been recorded, and I think it is extremely improbable that the organisms could live in such a highly vascular and highly organized part of an ovarian tumor. and in order that these organisms may act at the moment of complete strangulation they must already be occupying the ground. Of course, in cysts that have been tapped, and into which organisms may thus have gained access from without, the conditions are altogether changed, and then, if acute strangulation follow, real

gangrene may result. It is also possible that the Fallopian tube may bring the elements of septic change into contact with a strangulated ovarian cyst and produce a true gangrene, and this may be the pathology of some of the cases fatal after delivery or abortion; but to prove the truth of the theory we must have careful microscopic examination of the tissues in such a case, showing the presence of the cocci, and cultivation experiments also, if we are to be sure that the cocci are those known to produce poisonous change in the blood. I know of no such demonstration having yet been made."

Lespinasse¹⁸⁸_{Jan. 22} and Dudon¹⁸⁸_{Jan. 26} each report a cure of twisted pedicle in which violent colicky pains were the marked symptoms. In each the cyst was filled with a bloody fluid, and each case recovered. Schurinoff³¹⁷_{Apr. 14} reports a case of torsion causing ascitic fluid. Three gallons of fluid were withdrawn by tapping; four days later it had reaccumulated, and was again removed; three days after laparotomy was performed. A large adherent colloid cyst of the left ovary was found, with its pedicle twisted with half of a complete turn. The editors have seen the same thing happen. In one case gangrene had begun in the cyst wall. In our opinion the ascites is due, not so much to obstruction in the circulation of the tumor by the twisting of the pedicle, as Schurinoff contends, as to pressure of the tumor on large abdominal veins, which often is the cause of ascites when solid and cystic tumors are present.

Koeberlé¹⁸¹_{July 15} considers a constant dribbling of blood from the womb as a very sure sign of torsion of an ovarian cyst. But the most constant symptoms, as Gross shows,¹⁸⁴_{May 1} are abdominal pains and vomiting, sometimes accompanied by fever and evidences of peritonitis.

Intestinal Obstruction Due to Twisted Pedicle.—Hocheneggr⁸⁴_{Apr. 12} gives a case which presented symptoms of acute intestinal obstruction in a very marked degree. Laparotomy was performed, disclosing a multilocular cyst of the left ovary, which had become twisted on its pedicle. The ways in which occlusion of the intestine may be caused by torsion of the pedicle are: (1) the tumor may have become attached to the intestine or mesentery before the torsion occurs, then, when it happens, the intestine is wound about the pedicle and occluded; (2) a portion of the intestine may

be involved in the torsion and so be completely closed; (3) the torsion shortens the pedicle so that it may pull the tumor into the upper pelvic strait, where it will press upon and close the rectum; (4) after the torsion, but before the venous stasis, a portion of the tumor may be carried into the true pelvis, and there swell so as to compress the flexure or the rectum between itself and the bony walls.

Ovariectomy in Old Women.—Homaus⁹⁹_{May 3} successfully removed an ovarian cyst in a woman aged eighty-two years and four months, and also, with the same fortunate result, in two women aged, respectively, seventy-three years. To his own cases he adds those of other physicians of women aged seventy-five, seventy-eight, and seventy-nine years and ten months. Wells' oldest case was aged seventy-one years, and Keith's seventy-three. Terrier⁷³_{June 16} has recently and successfully removed both ovaries in a woman seventy-seven years old. Each one was an ovarian fibroma, and by pressure they had caused peritoneal dropsy.

The editors are cognizant of a fatal result in an old lady aged seventy-six, but this was done before the days of antiseptic. They also know of a successful case in a woman seventy-six years old, operated on by B. B. Wilson, of Philadelphia. On account of her age the late J. White, of Buffalo, N. Y., had declined to operate. Her convalescence was a good one, in spite of many intestinal adhesions, and she lived to reach the age of eighty.

Fancourt Barnes,²⁶_{Apr. 2} in speaking of the treatment of aged people after operation, calls attention to what he believes to be a most important factor in their management, and that is, a sufficient amount of movement in bed. The ordinary practice is to keep the patient motionless on her back during at least the first five or six days following the operation. It is difficult enough for the young and fairly healthy subject to pass through this ordeal without developing bed-sores or hypostatic congestions. Dr. Barnes is very careful to see that his patients are moved first on one side and then on the other, so that they may not lie continuously in the dorsal position. In his experience this is the only complication to be dreaded after ovariectomy in aged people.

Ovariectomy During Pregnancy.—Mundé's opinion²⁷_{Jan.} is that "so far as the chances of recovery from ovariectomy during pregnancy are concerned, they are fully as good as when no pregnancy

exists. As regards the continuance of gestation, in the early months usually the prospect is also favorable. In the later months, when the child is viable and likely to survive, the induction of premature labor would appear to be preferable, with subsequent ovariectomy. When the operation is not urgent, it is well to defer it until the child has attained viability, in case the operation should bring on labor. Both the greater difficulty of the operation, and the increased danger from septic infection and uterine hemorrhage at a later period of gestation, must also be borne in mind in deciding the question whether it is wise to postpone the operation. For, after all, the mother's life is always the chief consideration. Tapping the cyst is not to be advised, even as a means of temporary benefit, except in cases where immediate relief from distention is called for and ovariectomy cannot at once be performed."

Potter²⁷_{Nov.} records a very interesting case where both the diseased ovaries were removed without interfering with gestation, the labor going on to full term and the mother being delivered normally of a healthy child. This case goes to prove that the condition of pregnancy does not seem to interfere very much with abdominal operations; that pregnancy may go on to full term with both ovaries removed and a normal labor result, notwithstanding the theory of Tyler Smith that the ovaries direct the contractions of the uterus in labor. The fact that the patient operated upon nursed her child is another proof that lactation is not a substitute for menstruation.

Hydrothorax Complicating Ovarian Tumors.—Pascale⁹¹_{June 10} has found water in the chest in the large proportion of 6 per cent. of cases of ovarian tumor. This complication is due to mechanical and chemical conditions produced by the cyst. He refers to analogous work done in this field of research by French surgeons. Terrier, Terrillon, Verneuil, and Bouilly, of Paris; Potain, of Rouen, and Demons, of Bordeaux,¹⁵⁴_{Jan. 15} have also found the complication of hydrothorax associated with ovarian tumors—the last in the high proportion of one in every five cases. Menière does not agree with Demons that it is due directly to the great lymphatic communications which unite the pleura with the ovarian region. His more plausible theory is, that the pleural dropsy is due to the pressure upon the vena cava. This causes stagnation

of the blood in the upper venous trunks and consequent effusion. Yet he admits that in the last stages of ovarian tumor, when the constitution breaks down, local dropsy may occur from dyscrasia. Potain, on the other hand, alleges that the effusion is always on the same side as the diseased ovary; but this Menière, with justice, doubts. Bouilly met with this complication three times in thirty ovariectomies, and Verneuil says ³_{Dec. 28, '87} it should be called a dropsy of the chest, and not a hydrothorax, as if it came from inflammation. These cases will be relieved by the ablation of the cyst; but, if the patient's dyspnoea is too great to warrant the use of an anæsthetic, the radical operation should be preceded by the tapping of the cyst. Such cases have been met with by the editors, and in their opinion chloroform is the safest anæsthetic to be used under these circumstances, especially when œdema of the lungs is also present.

SEQUELÆ.

Intestinal Paralysis.—In speaking of peritonitis following an operation, Greig Smith says that "a case seen with distention, sickness, and restlessness has a Seidlitz powder prescribed, to be followed by a hot-water or turpentine enema, and it is almost taken for granted that at the visit next day the patient will have a flat abdomen, the sickness will have disappeared, and she will express herself as feeling infinitely better." Warren ⁹⁹_{Nov. 15} believes that this is often due to the breaking up of adhesions by the free peristalsis set up by the enema and saline cathartic, for he found in his experiments on intestinal suture in dogs that on reopening the abdominal wound, from three to eight days after the operation, the sutured point was in each case more or less concealed by a matting together of the mesentery and intestines, and that although fluid could pass through these coils without interference, still, there was a paralysis from local inflammation.

Reflex Disturbances Following Operation.—With regard to reflex disturbances after operations on the womb and the ovaries, Lucas-Championnière ¹¹_{Mar. 7} contends that they are most marked when the ovaries are the least diseased. Thus, in ovariectomy they rarely appear, but after the removal of healthy ovaries or of neuralgic ovaries they are very commonly observed. Sometimes they are of such severity as to cause death. After noting the fact that when the pedicle is forcibly dragged up to the wound for ligation

the patient often rouses up, the respiration is suspended, the pulse flags, and the patient hiccoughs, he states that reflexes, sometimes fatal, occur later which cannot readily be differentiated from shock. For instance, not earlier than twenty-four hours after the operation the pulse may become very frequent while the temperature is sub-normal. Dyspnoea will be present, and nausea with vomiting will be kept up, sometimes until the fourth or fifth day. But the symptom which he deems pathognomonic of these nerve reflexes is a constant hawking as if to bring up mucus lodged in the back of the throat. His treatment of these complications consists of morphia and potassium bromide.

Vomiting and Meteorism Following Laparotomy.—Chiara³¹⁷_{Sept. 22} has observed that these phenomena occur more frequently after the removal of diseased ovaries than when larger abdominal tumors are extirpated. He attributes them to the constriction of the nerves in the stumps. In the case of large, slowly forming tumors, however, the nerves undergo a certain amount of stretching, so that they are less irritable. The symptoms persist until the ligated stump becomes atrophied, when they cease spontaneously.

Menstrual Bleeding from a Laparotomy Scar.—At a recent meeting of the Kiew Obstetrical and Gynaecological Society Prof. George E. Rein⁵⁸⁶_{Nov. 7} showed a menstruating woman from whom he had about three years before removed a cyst of the right ovary weighing thirty-seven pounds, fixing the pedicle in the abdominal wound. The patient soon recovered and the wound healed, but at one part of the scar there remained a diminutive slough, which fell off just before the beginning of menstruation, its separation being followed by a constant flow of blood from the denuded surface during the whole catamenial period. The phenomenon had regularly recurred monthly ever since. As a rule, the scar begins to bleed somewhat earlier than the uterine flow makes its appearance. The menstrual blood from the cicatrix has a characteristic odor.

Parotitis Following Ovariectomy.—Bernays¹⁹⁹_{Sept.} is inclined to think that parotitis following ovariectomy is due to some infectious germs entering the system at the time of operation from the fact that there was an inflammatory condition of the abdominal wound as well as the glands in both his cases. He is loath to accept the now current idea that there is a secret sympathy between the parotid and genital glands.

Death after Tapping an Ovarian Cyst.—Rochet, of Antwerp,²⁷⁶_{Feb. 5} tapped a woman who had refused to have the radical operation performed. Twelve litres of a dark and thick fluid were removed. On the third day symptoms of septicæmia set in, which carried her off on the eighth day. The senior editor is of the opinion that a fatal result is more likely to follow tapping when the cyst is not wholly evacuated, or when the contents are too thick to escape through the cannula, and therefore ooze out into the peritoneal cavity through the opening made by the trocar. The golden rule of ovariomists is—do not tap.

Anæsthetics in Ovariectomy.—Through the fear of using anæsthetics in disease of the heart this complication is considered by some surgeons as a contra-indication to ovariectomy, but Solowiew, of Moscow,⁷²⁴_{v.12, No.14} thinks otherwise. He had a case of ovarian cyst in a woman whose heart was not only adherent to the pericardium, but it also was pushed over to the left. In addition she had pulmonary troubles, which had probably caused the cardiac mischief. The cyst had been repeatedly tapped, but it refilled very quickly, and the decline in health was rapid; so Solowiew performed the radical operation and found the chloroform narcosis well borne. She died on the forty-second day, from bronchopneumonia. The autopsy revealed very grave lesions of both lungs, while the left one was reduced to the smallest dimensions.

The editors have repeatedly given ether to cases in which disease of the heart was most marked. In one case of rheumatic heart the regurgitant pulsation of the jugulars was painful to witness, and yet the patient was kept tranquilly narcotized for nigh an hour. They, however, fear ether narcosis in disease of the kidneys and in pulmonary affections complicating ovariectomy, for in the one œdema of the lungs may supervene, in the other suppression of the urine. Chloroform is, therefore, the anæsthetic which they have been using for the past year, and with gratifying results.

Poisoning by Antiseptics.—Wettergren⁶⁷⁸_{v.12, No.2,5} reports a case of ovariectomy, followed by fatal poisoning from either the iodoform or the corrosive sublimate employed. The pedicle was powdered with ten grammes ($5\frac{2}{3}$) of iodoform, and twenty centigrammes (3 grains) were sprinkled over the cauterized follicles of the other ovary. The wound was also dusted with the same antiseptic and covered with

iodoform and sublimated gauze. On the fourth day a deep collapse took place; on the sixth day rectal tenesmus set in. This was followed by profound collapse and dysentery. On the ninth day the patient sang and laughed incessantly, and on the eleventh day died maniacal. Autopsy revealed great hyperæmia of the brain, abundant œdema of the pia mater, and diphtheritic patches in the large bowel.

K. A. H. Mörner, of Stockholm,³⁶⁵_{July 21} communicates a case of poisoning with benzoate of sodium, which he thinks is the first hitherto reported. A patient was operated on for an ovarian cyst (dermoid), but the cyst could not be removed. Its contents, however, were evacuated, and more than three ounces of benzoate of sodium, with some naphthaline, introduced into the sac. Some thirty hours after the operation symptoms of poisoning occurred. The patient sank into a condition of confused delirium, alternating with a sleepy condition; these symptoms passed away after a few hours. On the following day they returned in a milder form and then stayed away. The temperature during this time was 98.6° to 102.4° F. (37° to 39° C.). Perspiration did not occur in an important degree. There were no convulsions, but only trembling of the hands. The pulse was small—one hundred and twenty to the minute.

Statistics.—Dr. Pulido, corresponding editor at Madrid, Spain, says that at a meeting of the Spanish Gynæcological Society, on November 28th, Dr. Guiterrez gave statistics which comprised sixteen ovariectomies, done since 1886 to date, with four deaths,—one from shock, one from peritonitis, and two from septicæmia. These deaths occurred among the eight operations from 1886 to September, 1887, there being no bad results in the eight cases operated upon from September, 1887, to November, 1888, on account of the perfect antiseptic and operative measures.

In Terrillon's last series⁶⁷_{Jan. 29} of thirty-five cases he had four deaths. The first fatal case occurred in a woman with albuminuria who had had several serious attacks of peritonitis. The adhesions were very extensive, the operation lasted two hours, and the patient died twelve hours later from exhaustion. The second fatal case was in a woman aged sixty-one years, who had been tapped three months before, and whose cyst was universally adherent. Death took place also from exhaustion on the fourth day. In the third

case the adhesions caused so great a loss of blood that the woman died in thirty-six hours. In the fourth case all of a suppurating cyst could not be removed, and the woman died in five hours.

It will be noticed that no death took place from septicæmia. Terrillon uses every antiseptic precaution with the exception of the spray, which he deems useless, inconvenient, and dangerous. When much blood is effused into the peritoneal cavity he flushes it with boiled water, but in simple cases he advises meddling with the peritoneum as little as possible. Opiates he avoids as much as possible, because they constipate and thus keep the intestinal gases imprisoned. He opens the bowels early, either with calomel, castor-oil, or with the salts of magnesia. On the second or third day he begins to feed with milk, broths, tapioca, broth thickened with egg, or with meat powder. In very weak women he administers nutrient enemata, consisting of milk, alcohol, and the yolk of one or of two eggs.

In the discussion which followed the reading of this paper, Terrillon stated that, since sponges were injured by being boiled, and since he believed that high heat was the best means of assuring perfect antiseptis, he was using, with satisfaction, an artificial vegetable sponge prepared in Germany. Trélat stated that he used for sponges small bags of antiseptic gauze stuffed with chemically pure, absorbent cotton. Pozzi preferred the artificial sponge, while Terrier and Lucas-Championnière clung to ordinary sponges, which they believed could be perfectly sterilized.⁹¹_{Jan.} The editors hold to this last opinion, and employ sponges, some of which have been in use for many years. They rely first on a preliminary cleansing with warm water, next to steeping the sponges for twenty-four hours in a strong solution of soda, then to a thorough cleansing in running water, in which the sponges are kept for several hours. Finally they are put into jars containing a 5 per cent. solution of carbolic acid.

ECTOPIC PREGNANCY.

Etiology.—The cause lies in the obstruction to the onward progress of the ovum to the uterus. A considerable number of cases of ectopic gestation have occurred in association with fibroid tumors of the uterus, sometimes blocking the orifices of the tubes, sometimes by distorting the relations of parts. Other cases are found

associated with distortions of the uterus from flexions, others with inflammatory adhesions of the uterus or of the tubes, others from pressure upon the tubes from various causes. As a rule, erratic pregnancy is found to occur most frequently during a prolonged sterile period following a first confinement, which would go to prove that this accident is most commonly caused by injuries produced by first labors. As Cazeaux says: "When, indeed, we consider the narrowness of the tubal canal, we can readily conceive that any deviations, even slight ones, of the Fallopian tube, any paralysis or spasm, an excess or defect of the length, an engorgement, the swelling and ulceration of the mucous membrane, hardening of its pavilion, or any retraction of the internal orifice—in one word, all the anomalies and alterations described by authors—may take place there and give rise to it." Fecundation, as stated by our best physiologists, most frequently takes place in the ovary, and the fecundated ovule is then seized by the fimbriated extremity of the tube and deposited in the tubal canal, through which it travels until, reaching the uterine cavity, its development continues. Now, if any abnormality diverts the ovum from the route it is traveling it engrafts itself at the point of obstruction and it is there developed.

The prevailing opinion that all ectopic gestations are originally tubal, no matter what their location may be later on, Harris⁵_{Sept.} argues, is improbable, as it is difficult to credit the hypothesis that a tubal ovum may be forced entirely from its attachments through a rent in the tube wall, and the placenta, after its emigration, develop to full maturity in some remote region of the abdominal cavity. Much less difficult is it to believe that they are *ab origine* abdominal.

In support of this he says: "A bird's egg, a seed, and the bud of a tree are all endowed with independent vitality. Apply warmth to the egg and the incubative process commences. Cool it, and the embryo dies, because heat has now become essential to its new dependent existence. As the inherent life is lost, the egg cannot be made to hatch. By renewing the heat, it only hastens its decay. The incubative process must be continued uninterruptedly or it will end in failure.

"Moisture with heat will sprout a seed; dry it a second time, will it then produce a plant? No, it will decay. If a human ovum has lost its independent vitality by becoming attached to the

lining of the Fallopian tube or uterus and is made dependent for existence upon a blood supply, can it resume this lost independent life when it again emigrates to form a new home for itself? Will not the simple separation of an ovum *in utero* cause it to die and be expelled?"

Tait's theory¹¹⁰⁸ is that the chief function of the cilia found in the tube is to prevent the access of spermatozoa to the ovum before the latter reaches the uterine cavity, and hence tubal gestation is impossible unless the cilia have been removed by inflammatory action. He further believes that only the mucous membrane lining the tubes and uterus can retain and nourish an impregnated ovum. Also that in ectopic gestation adhesion of the impregnated ovum takes place to the wall of the tube instead of to the wall of the uterus, and then the ovum develops until the tube can no longer expand. Between the tenth and thirteenth week the tube gives way, and upon the position of the point at which the rupture takes place depends the variety of extrauterine pregnancy which is developed. By far the most common seat of rupture is out through the surface of the tube into the cavity of the peritoneum, because the proportion of the circumference of the tube which is covered by peritoneum is very much greater than the proportion of the circumference of the tube which is related to what is called the cavity of the broad ligament. This rupture into the peritoneum, so far as we can tell, is fatal in an enormous number of instances; what the proportion is we cannot say, probably about 90 or 95 per cent. Enormous sinuses are developed in the tube, and in the mass of the placenta these are torn, they bleed, the hæmorrhage is recurrent, and the patients die of hæmorrhage into the cavity of the peritoneum, forming the variety of intraperitoneal hæmatocele, or they die later on of purulent peritonitis.

No doubt some of the cases must end in the death of the ovum without much hæmorrhage and become absorbed, but it is perfectly clear that in these cases the tube will remain functionally useless, because it has been sealed probably at both ends by inflammatory disturbance, and therefore will be a perfectly useless organ.

The second form of rupture, into the cavity of the broad ligament, on the contrary, forms a condition which is never fatal, or only rarely so, one instance alone having been placed on record in which death has taken place from the hæmorrhage.

Doubtless in many of the cases of this variety the ovum dies at once, or is absorbed like an ordinary broad-ligament hæmatocœle. But in other cases the ovum does not die, but goes on developing to the full time, death, however, occasionally interfering with the progress of the pregnancy at the fourth, fifth, or sixth month. Then we have the group of cases in which, after suppuration has taken place, the bones of the fœtus are discharged through the rectum, through the bladder, or through Douglas' *cul-de-sac* into the vagina. There are also many cases in which a lithopædion is the result.

Symptoms.—The symptoms of extrauterine fœtation are those of the earlier months of pregnancy, occurring generally in women of thirty years and over, or in those who have been sterile or in whom some time has elapsed since the last pregnancy. At the end of the second or third month there is usually an abortive attempt at menstruation, sometimes with the expulsion from the uterus of decidual membrane in small pieces. The cervix is soft, and the os often patulous. The uterus is generally enlarged in proportion to the proximity of the growing ovum, which is ovoid in form, tense and fluctuating, with great tenderness on pressure and rapidity of growth. McCollom⁴⁰_{sept.} points out the frequently increased development of the uterus and appendages on the side where the pregnancy exists, also the fact that in some cases the uterus remains enlarged after the termination of the gestation, and that in other cases it shrinks to near the normal. The vaginal hæmorrhage in tubal pregnancy is also somewhat characteristic, coming in gushes of variable amounts during the painful paroxysms, and due to rupture of small superficial arteries from distention of the sac. At the time of rupture there will always be a slight show or a more or less copious discharge of blood, with severe agonizing pain and a sense of tearing, followed by symptoms of internal hæmorrhage with profound collapse.

Diagnosis.—The difficulty in the way of diagnosing tubal pregnancy is well illustrated by a case occurring in Périer's practice.⁷_{May} In December, 1887, the woman weaned her infant, and a few days after suffered from severe pains in left ovarian region. The attending physician deemed it a localized peritonitis and treated it accordingly. A few days later the pains returned, but quickly yielded to treatment. Fifteen days later obstruction of the

bowels took place, which, however, was also controlled. January 26th a free uterine hæmorrhage weakened the patient. February 26th, menstruation accompanied by analogous pains. March 14th, menstruation, violent colic, and appearance of a tumor. April 1st, metrorrhagia and colicky pains. April 9th, Périer punctured the tumor *per vaginam*, thinking that he was dealing either with a suppurating cyst or a hæmatocele. Blood escaped from the puncture, confirming the latter diagnosis. Some ease followed the flow of sanguinolent fluid, which lasted several days. On the 24th an abundant hæmorrhage came from the bowel, accompanied by excruciating pains. Death took place on the 26th.

At the autopsy a tubal pregnancy was found which had burst into the fold of the broad ligament and had perforated the lower portion of the colon. Two litres of black blood were removed. The editors have given these details in full, because the symptoms, with our present light, point clearly to rupture of the sac of a tubal pregnancy, and the surgeon, even if in doubt, should have performed either a laparotomy or an exploratory incision to determine the character of the disease. Further, extrauterine foetation is by no means so rare a complication as is supposed by the majority of the profession, and is, perhaps, the most common cause of sudden death in women. H. F. Formad, the well-known pathologist, is one of the two coroner's physicians in Philadelphia, and he holds now in his possession nineteen specimens of extrauterine foetation which he has collected within four years at inquests made by him in his official capacity.

Treatment (Medical).—In view of the fact that the diagnosis is obscure, it is argued that the better method of procedure would be, first, the application of electricity with the hope of clearing up the diagnosis, and then, if necessary, the removal of the sac by laparotomy.

It is maintained by some that the same thing happens in a tubal pregnancy as in the uterus when the foetus dies. As soon as the child dies or is killed the tube endeavors to discharge its contents, and as it cannot pass into the uterus the tube is ruptured, and that, therefore, electrical foeticide in preference to laparotomy would be improper, but this happens only when the tubal wall is so thinned by the size of the foetus as to make the use of electricity improper. Berry Hart, Thornton, Tait, and others who

believe that the placenta grows in some cases even after the death of the fœtus, urge this as an objection to the use of electricity, which may cause the death of the fœtus but will not prevent the growth of the placenta. This is denied by most operators.

Harris⁵_{sept} thinks that the size of an ectopic placenta depends to a certain extent upon the vascularity of its location, and although generally thinner, less developed, and sometimes divided into lobes, may often reach an enormous size while the fœtus is puny and emaciated, probably producing the impression that the placenta may develop after fetal death. How much more reasonable is it to suppose that a hypertrophied placenta prevented the fœtus from becoming of normal proportions at any stage of gestation?

The chief difficulty in using electricity is making a diagnosis in time. That a diagnosis can be made before rupture is proven by the cases of many operators, notably those of Thomas, Lusk, Janvrin, and Chadwick, who were able to obtain the fœtus in proof of its correctness. One objection to the use of electricity, outside of its results, seems to be a want of knowledge of its application.

We have practically at our command three methods: The first is the use of the galvanic or simple continuous current in the following manner: It is necessary to make the resistance between the abdominal electrode and tissues of the body as slight as possible so as to prevent pain. This end is probably best obtained by making the abdominal electrode of flexible metal, flat and large (three by five inches), and covered by well-moistened absorbent cotton, or placed upon a pad of wet potters' clay contained in mosquito netting or some other open fabric.

The vaginal electrode should consist of a metal ball with insulated stem, well covered by absorbent cotton. This method is probably the safest, as the current can be gradually increased in strength by means of a rheostat until from twenty to one hundred and fifty milliamperes are reached, making a current that will destroy fetal life without shock to the patient or danger of rupturing the tube. The negative electrode should be used in the vagina, for, while the positive is equally efficacious in destroying the life of the fœtus, it also has such a sedative effect on pelvic pain as to mask the symptoms, rendering future diagnosis difficult. With the

purpose of getting the full electrolytic action of the current, a galvanic needle introduced into the sac has been used in place of the vaginal electrode. This method, advocated by Apostoli, seems unnecessary, and also dangerous from suppuration and sepsis, on account of the electrolytic action of the current and puncture of the sac by the needle.

The second method is the interrupted galvanic current, the number of interruptions being dependent upon the susceptibility and temperament of the patient, and varying from ten to a hundred in the minute and even more. The strength of the current should vary with its effect upon patient and fetus, the smallest possible amount commensurate with success. Generally it is necessary to have several sésances before this end is accomplished, and, on account of the susceptibility of the patient, etherization must be resorted to when a powerful current is called for. Rockwell, of New York, who is an earnest advocate of this method to the exclusion of all others, recommends a current strength of between fifteen and thirty milliampères; probably an average of twenty is as strong as is ordinarily required. The electrode should be similar to those used in the first method. The vaginal electrode by a little pressure can be brought in close proximity with the mass, thus concentrating the current. The danger of this current lies in the fact that after the tubal walls become thinned by the growth within, a strong current, by the sudden contraction of the abdominal muscles, not from the contraction of the muscular fibres in the Fallopian tube, which are few in number, may cause spontaneous rupture, more especially when the pregnancy has advanced beyond the third month. This can be prevented to a certain extent by the use of an abdominal electrode large enough to diffuse the rays of electricity.

The third and last method is the use of the faradic, or induced, current, with either slow or rapid interruptions, the two objections to this current being the impossibility to gauge accurately its strength and the number and duration of the sésances often required to kill the fetus. According to Iandis, who experimented on fish by passing the current through the water in which they were, the time required at each sitting is half an hour and even longer. Mann, of Buffalo, who considers this current as efficacious as the galvanic with interruptions, says that if the faradic be chosen, the

secondary, or combined currents should be used as strong as the patient possibly can bear, and, this being without effect, to use an anæsthetic. A single-cell battery with a large coil will be sufficient in most cases.

The choice of poles is immaterial, since with the to-and-fro current of the faradic battery the polarity is changing with each impulse.

There are several theories as to the way in which electricity causes the death of the fetus—one that it is brought about by electrolysis, another that death is due to nerve-shock. Aveling²_{Mar.10} believes that death is due to the tetanic contractions of the fetal heart, resulting from the repeatedly broken current of an induction machine. Certainly, if this theory were correct, the more mechanical current, or primary coil, of the battery would be the more efficacious.

Landis,⁵_{July, '88} experimenting on beetles, minnows, and newly born rabbits, has directly proven the power of electricity to suspend, temporarily or permanently, the vital functions of these animals, depending on the strength of the current and on the duration of the application. He thinks that, in ectopic gestation, the current not only acts by destroying the fetus directly, but also by interfering with the placental circulation. After the death of the fetus it undergoes certain changes. Küchenmeister⁴⁵_{v.17} has made a careful study of these changes as they occur in the retained fetus, and classifies them under three heads—first, absorption of the fluid, calcification of the membranes, and mummification of the fetus; second, absorption of the fluid, calcification of the membranes, and calcification of the fetus at adherent points between the membranes and fetal surface; third, calcification of the entire surface of the fetus, with mummification of the inner parts. The fetus, in most of the cases collected by Küchenmeister, had reached full term, and had occupied the abdominal cavity for varying periods of time, the longest period being fifty-seven years. He states that, when the fetus is only partially calcified, it may soften and suppurate; but it is well to add that this only refers, as a rule, to the mature fetus.

Treatment (Surgical).—R. P. Harris⁵_{Sept.} says that the many stages of embryonic and fetal growth during which it may be necessary to perform exsection are as follow: (1) before rupture, while the embryo is presumed to be alive; (2) under the same condition

when the fœtus is already dead; (3) after the rupture of the tube, for the purpose of preventing the woman's death from hæmorrhage; (4) still later, when a living fœtus is developing subperitoneally, or within the abdominal cavity; (5) at or near fœtal maturity, in the hope of saving both mother and child; and (6) when the fœtus has been some time dead, to save the mother from the fatal effect of septic infection.

During the early months of tubal gestation before rupture the product of conception can usually be removed with great ease. The sac can be removed and hæmorrhage controlled by the proper use of the ligature. In more advanced pregnancies, where the tube has ruptured into the broad ligament, the total removal of fœtal sac, membranes, and placenta, although more difficult, is seldom impossible if we separate adhesions carefully and ligate large bleeding surfaces, or the broad ligament *en masse*, instead of attempting to tie separate bleeding points on the placental site. This will prevent primary hæmorrhage, and, in case it is decided to leave the placenta, will avoid the danger of secondary hæmorrhage, which is very apt to follow on the final separation of the placenta where it has been left *in situ*. If from the number and the vascularity of the adhesions to important organs the placenta cannot be removed, the plan is then to resect as much of the sac as necessary, and attach the edges evenly to the lower angle of the abdominal wound so as to shut it off completely from the peritoneal cavity, leaving a sufficiently large opening to extract the placenta later on, or, if desired, resect as much as possible of the sac, stitch the opening carefully together, and drain through the retrouterine pouch. This operation admits of the entire closure of the abdominal wound. Or, for the more complete drainage of the sac and its contents, we may drain through both abdomen and vagina.

Thomas, Barnes, Hicks, Koeberlé, and others advise against the removal of the placenta ¹_{Aug. 4} in advanced pregnancy from the danger of a fatal hæmorrhage. Under such conditions, if it is decided to drain through the vagina, the placental cord should be brought through the opening to facilitate its removal.

Rutherford Morison ³⁶_{Aug.} believes that when the sac and fœtus are too adherent, or too large to be removed entire, the sac should be carefully incised, and if hæmorrhage occurs the incision should

be plugged by a sponge, the sac stitched to the abdominal wall, and the fetus removed at a convenient time when all danger of hæmorrhage has passed.

That an ectopic fetal growth *at full maturity* can be removed wholly by a form of enucleation has been proven by Breisky,^{5 Sept.} of Vienna, who, by means of a process of subperitoneal ligation and exsection, performed the operation successfully for both mother and child. This method may, perhaps, be made available also in some cases of intraperitoneal development.

That the death of the child will in time sever the vascular connections of the placenta and allow it to be more easily detached is important in deciding an *operation by election*, but it should be also remembered that it is exceedingly dangerous to wait, notwithstanding the fact that many women have escaped all danger and have even carried the dead fetus for years in comparative health, or have had it removed later by abdominal or vaginal section.

The question of the vaginal or the abdominal incision as the proper one for an eligible outlet depends upon the position and presentation of the fetus. As a general rule, when the head bulges out and thins the tissues posterior to or on either side of the cervix, delivery may be best accomplished by vaginal exsection and advanced by the forceps. Living children have been preserved in this way, and the danger to the mother is not so great as by the abdominal method.

The fact that the fetus is not found during an operation does not prove anything, for the absorptive powers of the peritoneum have been proven remarkable. Petch^{39 Sept.} relates a case of pregnancy so advanced that he could hear the heart-sounds, yet when the fetus died it was almost completely absorbed. This case seems to lend support to the opinions of Veit, Leopold, and Lesonej, who believe that most pelvic hæmatoceles, especially those which are retrouterine, are the result of ruptured tubal pregnancy.

Dr. Eklund, corresponding editor at Stockholm, reports a very interesting case of successful operation for ectopic pregnancy performed by August Wibough. The cyst had ruptured, and the patient was *in extremis*. As soon as the peritoneal cavity was opened, a large quantity of clear blood was violently forced out, and followed at once by a mass of intestines, pushed out by the pressure of the blood yet remaining beneath them. About two litres of blood

were removed, and also the ectopic cyst, which was as large as the fist, and contained a fœtus about four months old. As soon as the tube was ligatured all hæmorrhage ceased. The bowels now could be readily returned. The patient recovered.

The editors have met with a successful case quite analogous to this one, in which the tube had ruptured, the belly was filled with old blood, the intestines were forced out and could not be replaced until the peritoneal cavity had been cleansed.

Dolérís ⁴⁸_{Aug. 1} presented, at a meeting of the Paris Obstetrical and Gynæcological Society, a fœtal tubal sac which he had removed whole, without at first knowing what it was. The adhesions were very extensive, and the patient died a few hours later from shock. The sac contained a fœtus about five months old.

Championnière criticised the extirpation of the sac in this case, and advised, instead, incision into it, removal of the fœtus, stitching of the edges to the abdominal wound, and drainage. In this manner he had performed two operations with success.

Kirmisson ²⁴_{June 17} reports a successful case of laparotomy for ectopic gestation of three years' duration. Conception took place early in April, 1884. Six weeks later, after a fit of anger, she experienced great abdominal pain, accompanied by nausea and metrorrhagia. Blood dribbled away continuously for two months and a half. Fœtal movements were felt early in August, but they soon died away. Milk was now secreted by the breasts, and it did not disappear until May, 1885, when the catamenia reappeared. The operation was performed August 17, 1887, because the patient was being killed by septicæmia through decomposition of the fœtus. The sac adhered to the abdominal wall, and the peritoneal cavity was, therefore, not invaded. It contained pus, fœtal gas, and the broken-down fœtus, which was removed in fragments. Two drainage tubes were put in, but convalescence was interrupted by a fœcal fistula which appeared on the ninth day, and had not closed wholly six months later.

Kirmisson cites the thesis of Maygrier, who has collected seventy cases of laparotomy for extrauterine fixation in which the child was dead, and seventeen cases in which the child was living. Of the former there were forty-five recoveries, but out of the latter fifteen mothers died and very few children were saved. R. P. Harris has collected twenty-five such cases, in which twenty-

three mothers and eighteen children died. To these cases should be added a later one by Breisky,⁸⁴_{Dec. 10, '87} in which he removed the sac of a tubal pregnancy of seven months' duration. Provisional sutures were first applied, sewing the sac to the abdominal wound. The incision into the sac was made directly over the placenta, and the hæmorrhage was at first great, but it was checked by catch-forceps. The child, a female, was next extracted. It cried lustily. The intestines having escaped, they were replaced, and kept in by one suture in the middle of the abdominal wound. The attachment of the sac to the broad ligament was secured by cobblers' stitches before it was cut away, and a mass ligature was thrown around the uterine attachment. Intestinal adhesions had to be severed, and the whole of the appendix vermiformis had to be detached. Many vessels of large size were tied, and the right ovary was removed. The abdominal wound was closed, excepting its lower end, into which a tent of iodoform gauze was inserted. The mother recovered, but the child died three weeks later from umbilical phlebitis.

Another case of recovery of the mother after removal of the dead fœtus and sac, the fifth case in Russia, is reported by Zajajitsky.³¹⁷_{Oct. 6} Rupture had taken place into the fold of the broad ligament, probably at the sixth week, when a violent uterine hæmorrhage took place, but the fœtus continued to live until it was six months old.

Breisky had another case in which, two years after the death of the child at term, he opened the sac and removed the putrid contents. The sac was not removed in this case. The woman had septicæmia at the time of the operation, and she died six days after the operation. He mentions another case in which the child died at term, and the mother felt herself so well four months after that she would not allow an operation to be performed. The tumor had lessened in size, and the two monthly periods had appeared. Breisky counsels the removal of the sac when possible. One of these cases is referred to by Dr. Bayer, corresponding editor at Prague.

Dr. Mygind, corresponding editor at Copenhagen, reports a case of laparotomy by Meyer.³⁷³_{184.6, p. 745} for an extrauterine gestation of five months. A very serious hæmorrhage was arrested by packing the cavity with iodoform gauze, which was removed on the fifth day. The patient recovered.

Dr. Eklund, corresponding editor at Stockholm, gives the history of a fatal case of extrauterine fœtation, in which the sigmoid flexure of the colon was wounded during the operation and a communication made from it to the sac. In another case ⁶⁷⁸_{Oct.} the sac evidently ruptured, symptoms of general peritonitis followed, but the woman recovered without an operation. In each case the woman was forty-two years old.

Meinert and Leopold ¹²³_{Nov.15} each give the history of ten cases of laparotomy for tubal pregnancy, the details of which we have not the space to give, but which we note for the benefit of workers in that subject; but the journals are now full of such cases. Leopold's cases consisted of two tubal, two interstitial, one tubo-abdominal, four abdominal, and one ovarian.

A very interesting and almost unique termination to an ectopic gestation was related by Morisani ⁴¹_{Nov.19} to the Italian Obstetrical and Gynæcological Society. After symptoms pointing to rupture of the sac, fœtal movements ceased, fever set in, and hæmorrhage came from the bowels. When admitted to the hospital one fœtal foot protruded from *the anus*, and Morisani by traction delivered a perfectly formed fœtus of five months. No trace of the placenta could be found; nor was there an umbilical cord, the navel being represented by a hole communicating with the umbilical vein. The woman recovered promptly. Morisani adds that in the annals of science there are but three other cases in which an extrauterine fœtus in a perfect state of preservation was delivered *per anum*—viz.: those of Pigcolet, Burkhardt, and Ivisack. In four other cases, those of Woodbury, Howard, Janvrin, and König, macerated and decomposed fœtuses escaped *per anum*.

To this curious case the editors would like to add one that occurred in their own practice some years ago. A pregnant woman stepped upon a chair, the back of which was half broken off. In reaching up she lost her balance and fell upon the remaining standard of the chair. The blow ruptured the womb and the fœtus escaped into the fold of the broad ligament. There it remained for over a year, when fever set in and an offensive discharge began to flow from the vagina, for which she sought advice. By dilating the cervical canal by sponge-tents access was gained to the endometrium. In the right wall of the wound was found an old perforation leading into a cavity in which lay the decomposed fœtus.

With great difficulty, the bones, flesh, etc., were removed piecemeal. The woman recovered after a severe attack of pyæmia, from which she lost an eye by abscess of the orbit.

Statistics.—In comparing the mortality of exsection and electrical feticide, Harris⁵_{Sept.} calls attention to the fact that of the forty cases of the latter performed in the United States and Canada and collected by himself but one died, and in that case hæmorrhage had occurred from a superficial artery in the cyst-wall, which had previously bled nine days before. In such a case exsection should have been performed. Certainly an investigation into the secondary dangers experienced and into the condition of health exhibited by women who have had electrical feticide performed upon them would be of prime importance in determining the question of Electricity *vs.* Exsection. The comparative harmlessness and ease in the administration of electricity, and the danger and difficulties in the way of exsection, might well prevent one from performing the more radical operation, and give at least the more conservative method a trial.

DISEASES OF THE VAGINA AND EXTERNAL GENITALS.

BY W. H. PARISH, M.D.,
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VULVA, CLITORIS, AND HYMEN.

Pruritus Vulvæ.—Pruritus vulvæ has lost much of its power since the introduction of cocaine, many observers during the past year having used it with success, while others report only temporary amelioration of the distress. Alexander Duke²_{July 14} recommends penciling of the parts with menthol cones (composed of menthol and camphor). Von Campe²_{Feb.} reports the case of a patient, aged fifty-three, suffering from intense irritation of vulva, perinæum, and groin, of two and a half years' duration, in whom cessation of the symptom was caused in two days by the use of a constant current, the anode being applied to the vulva and the cathode to the various other parts affected. Various remedies had been previously tried for her relief and found wanting, even to the excision of the most sensitive portion of skin and mucous membrane.

Lipoma of the Labia and Adjacent Parts.—W. Balls-Headley²⁸⁵_{Aug. 15} reports a case of lipoma in the above locality in a married woman aged fifty-one years. A tumor was observed in the left labium the size of a duck's egg, occupying the position and of the same appearance of a cyst of the gland of Bartholini. Continuous with it, though marked by a constriction, was an elongated tumor, giving impulse on coughing, and extending along the left vaginal wall, so as to lift the os uteri beyond the reach of the examiner's finger. Similarly connected was a rounded tumor, apparently four inches in diameter, prominently located over the left ischium. Though fluctuation appeared to be general, trochar failed to show fluid. The family history of the patient is reported as malignant, her sister and two aunts having died of uterine cancer and her maternal grandfather of cancer of the neck. Balls-Headley operated by incising the tumor and enucleating it with his finger. The ischial tumor was similarly dealt with, such hæmorrhage as resulted being readily controlled. The wound was closed by suture and a

drainage tube introduced, which was frequently injected with a one in forty solution of carbolic acid. Microscopic examination showed fat-cells and connective-tissue cells. This form of tumor of the labium is rare. The fact of the history and physical examination having suggested labial hernia attaches considerable interest to this case.

Bock¹⁵⁴ reports from the clinic of de Smet a case of lipoma in a young woman, aged twenty, who had been admitted into the venereal ward with taint of syphilis. After three weeks of treatment by hypodermic injections of corrosive sublimate, all traces of specific lesions had disappeared. It is of special interest to note that the woman had in addition, in the left labium majus, an elongated tumor measuring twelve centimetres in length by six in breadth, presenting somewhat the appearance of a pear suspended by the stem, at the external orifice of the inguinal canal. The tumor was quite soft and movable, and by taxis appeared to be reduced to less than half. Its origin dated back eighteen months, and when first observed by the patient was the size of a walnut. It developed, and extended from above downward. The pedicle evidently penetrated the inguinal canal.

Bock shows from an anatomic and embryological consideration that in this region we might find fatty tumors, hydrocele or other cysts, and inguinal hernias. He located the tumor in this case in the dartos sac because of its pyriform shape, its situation, and its direction. The absence of fluctuation rendered untenable a diagnosis of hydrocele of the canal of Nuck, of which Richelot reported an interesting case. De Smet made a longitudinal incision in the direction of the axis of the tumor with due anti-septic precautions, and dissected layer by layer, as if operating for strangulated hernia. He found the tumor superficial and surrounded by a thick fibrous capsule. It was composed of a fatty mass which partly enucleated itself spontaneously by expression from the base, and was partly removed with the fingers. The tumor had extended into the enlarged inguinal canal. In the fatty mass around the inguinal canal were found longitudinal fibres of the round ligament. This mass was dissected out with precaution in order to avoid penetrating into the abdominal cavity and causing a consecutive hernia; de Smet then resected the fibrous sac which surrounded the tumor, and closed the wound

with six catgut sutures, a drainage tube having been introduced. Bock refers to the rarity of this tumor, especially as to its development in the mass of fat within the dartos.

Cystic Tumor of Labium Majus.—Hunter P. Cooper²⁰⁷ reports a case of cystic tumor removed from the labium majus of a colored woman. The tumor had been slowly growing for four years, giving pain only during menstruation and sexual intercourse. The labium having been treated antiseptically, a 10 per cent. solution of cocaine was injected in five different places in the neighborhood of the tumor. An incision was then made on the outer side of the labium and the tumor dissected out. No pain was experienced, and no ligatures were required. The wound was thoroughly irrigated with bichloride solution, closed with catgut sutures, and dressed antiseptically.

About one hour later Cooper was hastily summoned to the patient and found that there had been profuse hæmorrhage, the blood still rapidly flowing from between the stitches and the labium distended by clotted blood to the size of an orange. The patient was gasping and complained of obscurity of vision. The wound was immediately reopened and the source of the hæmorrhage sought for, but the application of a ligature was soon ascertained to be impracticable. The doctor resorted to the use of hot water and pressure, thus restraining further hæmorrhage until he could apply the tincture of ferric chloride, which entirely checked it. The patient was very feeble from loss of blood, but gradually rallied after hypodermic injections of atropia and strychnia. The hæmorrhage was attributed to a rupture of one of the large veins in the bulbus vestibuli, whose walls had been weakened by the removal of the tumor.

Hæmatomata of the Vulva and Vagina Following Labor.—

In a report of six cases of post-partum hæmatomata, A. A. Henshe¹²⁴ says: "These hæmatomata or thrombi are dependent upon the rupture of a blood-vessel, usually a vein, in the cellular tissue of the vulva and in that surrounding the vagina. Occasionally the thrombus is located in the latter region, but, as a rule, it occurs primarily in the labium and is usually unilateral, developing during or immediately after labor and rapidly increasing in size. Shooting pains usually accompany this affection, extending down the legs and into the back. His first case was a primipara,

of twenty-one years, delivered of a child of ordinary size. Forceps were used after the head had presented at the inferior strait. About twenty-four hours after confinement the vagina was found to be almost occluded by an elastic and painful swelling on its left wall. Ergot was administered and ice introduced into the vagina, which was irrigated every four hours with a solution of carbolic acid.

On the second day the temperature rose to 101° F. (38.33° C.), which increased to 103° F. (39.46° C.) on the third day. The tumor apparently had not increased and the applications of ice were replaced by hot fomentations to the hypogastrium. On the fifth day the tumor ruptured and there followed a copious discharge of a fetid, dark fluid. Upon introducing his finger Dr. Henshe found an opening the size of a half-dollar on the left side which led to a cavity about three inches deep. Irrigation with a solution of carbolic acid was continued till about the fifteenth day, the cavity gradually decreasing in size, and four weeks later it was found completely cicatrized.

Case II was in her third labor, which had not long set in when a tumor was noticed on the right labium majus which rapidly increased in size, the swelling extending to the perinaeum. An examination had just been completed when the head of the child passed through the orifice of the vagina, rupturing the tumor and partially lacerating the perinaeum. Though considerable blood was lost, the tumor did not decrease in size, but, on the contrary, increased for the first few hours after external hæmorrhage had ceased. There was no fever, and the tumor, which then gradually became smaller, disappeared entirely in three weeks, the same local treatment having been instituted as in the previous cases.

Case III was a healthy primipara, aged nineteen years. A child of medium size was born alive after a normal labor. The right labium majus began to swell and became of a dark-red color soon after labor. The swelling increased to the size of two fists, involving the labium minus. Two days after delivery the lochia became fetid and the patient feverish. On the third day she had a severe chill, the temperature reaching 104° F. (40° C.). The vagina was washed out with carbolic acid solution, but it was found too painful to introduce the double-current catheter. Calomel, quinine, and opium were given internally. On the fifth day, the temperature

having reached 105° F. (40.55° C.), an incision was made on the inside of the tumor, about one-half pint of fetid, bloody fluid escaping. The cavity was then treated antiseptically. In spite of the administration of quinine in full doses the fever and chills were but slightly affected, the temperature ranging from 103° to 104½° F. (39.46° to 40.28° C.) until the eleventh day, when it lessened gradually, disappearing entirely on the sixteenth day. The antiseptic treatment was kept up and by the sixth week after confinement there was complete cicatrization.

Case IV was also a thrombus of the labium majus, but, with the exception of being less in proportion, did not differ materially from the previous case.

Case V, a multipara of thirty-seven years, had always enjoyed good health with the exception of having hæmorrhoids and varicose veins in both legs. During the second stage of labor a swelling suddenly developed on the anterior vaginal wall, which was somewhat prolapsed. At first the size of a fist, the tumor assumed such dimensions as to become an impediment to delivery, and the forceps were applied, but in order to complete the delivery it was necessary to make an incision and turn out the accumulated blood. After the completion of labor the cavity of the hæmatoma was injected with a solution of persulphate of iron and ice was applied, which successfully controlled all hæmorrhage in about two hours. Ergot had been given internally. This treatment, together with irrigation of the vagina with corrosive sublimate solution (one to one thousand), completed the cure within three weeks.

Case VI was aged twenty-seven, and in her second confinement. She had always been in delicate health. Soon after a normal labor pain was referred to the left labium majus and the left side of the ostium vaginæ. Upon examination on the following day, a swelling similar in character to those above noted was discovered on the left labium majus. One day later it had extended one and one-half inches above the ostium vaginæ along the left vaginal wall. Cold applications were made, and in two days' time it began to diminish in size. The patient left her bed on the ninth day, but the swelling, now fluctuating, still remained. On the fourteenth day Dr. Henshe found that the tumor had opened near the orifice of the vagina, discharging a blackish, fetid fluid. The cavity of the thrombus and the vagina were kept cleansed with

bichloride solution (one to one thousand) and healing was complete in about seven days.

Of these six very interesting cases it will be seen that absorption of the exuded blood did not occur in either case, and either spontaneous rupture occurred or an incision was made. I believe that too early an incision should not be made, though the size of the hæmatoma may be such as to demand an incision prior to the delivery of the head. After waiting, however, three or four days, and there is threatening rupture or existing high temperature, under either of which conditions absorption cannot progress, then a free incision should be made with strict antiseptic precaution. The cavity should be thoroughly cleansed and antiseptically douched. To control bleeding the iron salts should be avoided, as liable to lead to later hæmorrhage on separation of the hardened coagula and the superficial sloughs occasioned by the iron styptic. Antiseptic packing, with vinegar as a styptic, will generally be sufficient to prevent hæmorrhage. Before rupture or incision a rubber bag containing ice should be carried into the vagina and removed sufficiently often to admit of the escape of the lochia and also to permit vaginal, or, it may be, intrauterine antiseptic douching.

Kraurosis of the Vulva.—Heitzmann, of New York,²⁴⁵_{Nov.} calls attention to kraurosis of the vulva, which he describes as a chronic eczema, and which is probably produced and is always accompanied by a mucopurulent vaginal discharge. He met with marked success in four cases by removing the thickened patches with a sharp spoon.

Epithelioma of the Clitoris.—Richet³_{May 2} has had a case of primary epithelioma of the clitoris in a woman, aged forty, in his ward at the Hôtel Dieu. The tumor was removed by him with the thermocautery.

Abnormalities of the Hymen.—Several valuable investigations upon the nature and occurrence of cysts of the hymen have been made within the past year. Robert Ziegenspeck⁹⁵_{Id., 69, H. 1} describes the microscopical characters of two hymeneal cysts, and believes that his investigations prove their origin to be from an infolding and cutting off of epithelial plugs from the surface, instead of from a hypertrophy of the border of the hymen. This explanation of their origin is also borne out by J. W. Ballantyne's microscopical examination²⁶¹_{Nov.} of two hymeneal remains that were removed for

vaginismus, and in which he found numerous infoldings of the surface epithelial layer with the resulting formation of numerous spaces. Piering⁸⁴_{Feb. 4} describes the case of an adult in whom there were multiple cysts of the hymen due to long-continued mechanical hyperæmia of the abdominal organs, no alteration in the lymph-vessels having been found. E. Demange¹⁸⁴_{May 1} reports a case of what he designates "*hymen en spirale*" occurring in a young woman, aged sixteen, upon whom an assault had been attempted five days prior to his examination. His first impression was that the hymen had been ruptured, but on closer inspection it was perceived that the two segments of the hymen, instead of being slightly separated, overlapped each other, the left above the right, at a distance of three millimetres. The extremity of the right segment terminated abruptly, that of the left being insensibly continued into the inferior circular fibres of the vaginal orifice. The overlapping of the two portions of the hymen, as well as the terminations of the two segments, precluded the idea both of violence and of a pathological causation of the condition found.

VAGINA.

Atresia of the Vagina.—H. M. Wilson¹⁰⁴_{June 2} reports the case of a woman whom he was called upon to deliver, and in whom was found a membrane occluding the introitus vaginæ except for a very minute opening. Labor progressed, and the membrane yielded before the advancing head sufficiently to permit of labor without operation. W. Zinsstag³¹⁷_{p. 219} has recorded the case of a patient who was in labor, when a bluish membrane was found stretching from the dilated orifice of the urethra to the fourchette. No opening could be found in this obturator, but the recorder explains its absence by closure of a small opening during pregnancy, and believes that coition must have been effected through the dilated urethra. By means of incisions through the membrane and in the perinæum delivery was accomplished. Schauta⁶⁹_{Aug. 2} performed Porro's operation upon two cases of pregnancy complicated by atresia of the vagina. The first patient was a primipara with atresia by scar-tissue resulting from a former scarlatinal attack and aggravated by coitus. Mother and child were both saved. The other case was a secundipara, whose atresia was caused by injury during a former labor. Porro's operation saved the mother, the

fœtus having been found dead and macerated. In this case Cæsarian section was intended, but, owing to the maceration of the fœtus and to pathological changes found in the endometrium, Porro's operation seemed indicated. The cases are also of interest from their proving the practicability of withdrawing the child even after the head is engaged in the pelvis, as had occurred in both of these cases.

At the Italian Society of Obstetrics and Gynæcology Turetta³_{Sept.12} reported a case of vaginal atresia with hæmatometra and hæmatosalpynx, in which he had cured the patient by means of gradual evacuation through a small opening in the septum, and Morisani a case of similar character which he had cured by the formation of an artificial vagina followed by gradual dilatation by Hégar's instruments. Max Rosenthal¹⁵⁰_{Sept.} transcribes a case of pyokolpos and pyometra from congenital atresia vaginæ, probably associated with a bicornuate uterus that was successfully operated upon by Rein, by aspiration followed by incision and drainage.

Vaginismus and Vaginitis.—Another remedy of at least palliative value in vaginismus has been more or less highly recommended by various observers, namely, cocaine. That it should have a curative effect can to our minds only be explained by the breaking up through its local anæsthetic effect of a neurotic habit, and by eliminating expectation as a predisposing cause. J. D. Hayward²_{Sept.29} reports a good result from the introduction into the vagina of small portions of an ointment of cocaine, five grains to one ounce (0.32 to 31 grammes). T. M. Madden²_{Oct.6} has used cocaine in 5 per cent. solution. He has found it to be merely palliative, except for the fact that it may allow of the occurrence of impregnation with the result of a natural cure when delivery occurs. James Edwards²_{Oct.13} obtained a good result from the use of suppositories containing one grain (0.065 gramme) of cocaine. Keller²⁷¹_{Jan.} recommends gradual stretching of the outlet by means of a graduated set of wooden bougies. Girard¹⁵¹_{Feb.15} prescribes potassium bromide, thirty grains (two grammes) per day. Sulphate of quinine, if there is any access of intermittent fever, frictions to the dorso-lumbar spine with a liniment composed of chloroform, one part, and oil of henbane, four parts, with the addition of suppositories containing extract rhatany and ol. theobroma, each two grains (0.129 gramme) if fissures of the vulva co-exist. N. Gulmann⁸²_{July 1}

highly recommends the following treatment in cases of vaginitis associated with vaginismus: The vulva and anointed bivalve speculum are to be painted with a 4 per cent. solution of cocaine, the speculum introduced, and a solution containing zinc sulphate, one to two grains (0.129 gramme); chloral hydrate, five grains (0.32 gramme); glycerine and water, each one fluidrachm (four grammes), poured into the vagina. By gradually withdrawing the speculum to near the orifice of the vagina the solution comes in contact with all of the vaginal mucous membrane. The speculum is again introduced and a tampon of cotton is inserted with a string to facilitate withdrawal. The tampon is removed in four or six hours. The application is made three or four times a week, hot vaginal douches of borax and water being employed between the applications. Bremer⁸²_{July 7} mentions a case of vaginismus occurring in a tabetic patient where no local lesion was discoverable and on whom many ineffectual operations had been performed. The local condition was by him attributed to peripheral irritation dependent upon the spinal disease.

Vulvovaginitis.—Van Dusch⁶⁹_{Oct. 11} contributes an exhaustive paper on infectious colpitis of little girls. The youngest child in his series was aged one and a half years, the oldest twelve years, the largest number (ten out of a total of nineteen) being between the ages of two and a half to four years. Of the nineteen cases nine were cured, four were improved, and six were removed by friends. The duration of treatment in the successful cases varied from three to ten weeks, the average being seven weeks. Various remedies were employed by means of irrigation, viz.: tepid water, solution of bichloride of mercury (one to three thousand to one to five hundred), solutions of sulphate of zinc (one to six hundred), carbolic acid (2 per cent.) and 2 per cent. solution of thallin. Iodoform bougies were also used. No one measure particularly recommended itself, the quickest cure having resulted from irrigation with a solution of corrosive sublimate (one to two thousand), although the same agent in a solution of the strength of one to five hundred failed to cure in many weeks. Turning to etiology, he finds that in many cases a similar affection existed among parents or relatives, that all of the cases were from the lower classes and were suffering from uncleanness, neglect, etc. In all of the cases observed by him Neisser's coccus was found in the discharge. He

adduces numerous cases apparently incontrovertibly proving the contagious character of the affection. He also calls attention to the fact that adults transmit without contracting the disease. He differs from Fränkel and Flügge, agreeing with Cséri that the microorganisms found in the discharges are identical with Neisser's gonococcus. In his cases the relation of the disease to scarlet fever and its sequelæ was marked. He emphasizes the necessity for isolating cases of this disease occurring in hospitals for children. Ollivier,³_{Oct. 24} in a paper read before the Académie de Médecine, described an epidemic of vulvovaginitis in children occurring in his ward, the disease having been introduced by two children admitted for a vulvovaginal discharge, and being propagated in three weeks to many others, finally stopped by careful disinfection and prophylaxis. He believes that in the present state of knowledge the contagious principle cannot be demonstrated.

Suchard, of Lavey, France,¹¹⁸_{p. 265} reports an instance in which twelve girls, between six and fourteen years old, slightly scrofulous, had been bathed together in the same tank, their genitals having been previously examined. On the fourth day following, one of them, six years old, was found to have contracted a vulvovaginal catarrh, and within five days more the remainder were similarly attacked. Sprengel, of Dresden, in a summary of these cases, pronounced the water as the medium by which the infection was conveyed to the eleven children, but considers that a like origin cannot be with certainty established for the first case.

Lawson Tait¹²¹⁸ calls special attention to the chronic vulvovaginitis of children. This affection, he says, has usually no history of an acute stage. It is generally discovered by the child evincing pain on micturition, being found manipulating the organ, or by stains on the linen. He says that if closely watched many of these children will be found to masturbate, but he is unable to say whether this habit is the cause or the consequence of the disease. In a few cases he thinks it is the cause. The seat of inflammation will be found to be almost solely the labia majora and minora and the anterior surface of the hymen. The vagina is rarely involved. Tait believes that in a large number of cases it is due to a want of cleanliness, to a collection of the natural secretion of the parts and its subsequent decomposition. In a few cases he found it due to ascarides in the rectum, and in one case detected a piece of

worsted thread, apparently gathered from the carpet, and which produced the irritation. He also cites a case of chronic discharge from the vulva of a girl, six years old, due to a collection of pins, thread, and rubbish of various description, introduced by herself or companions. Authors are agreed that a proportion of these cases are due to constitutional conditions, which, as a rule, will yield only to a change of climate in connection with appropriate constitutional and local treatment. Milder cases yield rapidly to a careful toilet and the application of astringent ointments. Actual assault upon a child, though of comparatively rare occurrence, should be always kept in view as a possible cause of such infection.

Sarcoma of the Vagina in Children.—Schuchardt³¹⁷_{p.422} read before the Second Congress of the German Gynæcological Society a paper based on two cases of malignant disease of the vagina in children. Both had been operated upon in Volkmann's wards. According to Schubert, of the seven cases already recorded by Ahlfeld, Sängers, Bahès, Demmel, Saltmann, Hauser, and Heintal respectively, in only one was the tumor noticed at birth; the ages of the patients ranged from two to five. The growth usually appeared as an irregular prominence, like a bunch of grapes, and always proved very malignant in its clinical history. Volkmann's first case occurred in a child, aged seven, who died from recurrence of the sarcoma two months after operation. His second case was five years of age. She had fallen ill early in 1885, at which time a swelling about the size of a bean protruded at the vulvar aperture during each spell of coughing. The growth was excised, together with a piece of the vaginal wall about "the size of a ten-pfennig piece," in September, 1885. Six months and two weeks later local recurrence was detected; a tumor about the size of a walnut was removed, and with it the lower half of the posterior vaginal wall. The cut margin of the upper half was drawn down and sewed to the perinæum. In this case, which recovered satisfactorily, there was no recurrence up to May, 1888. The new growth was in both cases papillomatous. The internal structure bore the microscopic characters of a round-celled sarcoma. Dr. Schuchardt believed that the tumors took their rise from certain papillary structures which normally exist in the region of the vulva.

A. M. Cartledge,²²⁴_{Oct. 25} in a paper read before the Louisville

Medico-Chirurgical Society, reported an interesting case of vaginal tumor with the following history: On February 8th of the present year, O. M. (thirty-four years), after having menstruated two days, noticed an enlargement in the vagina about the size of a hen's egg. Soon after there appeared a constant, scant, watery secretion, offensive in character, and associated with pain in hypogastric and right inguinal regions, menstruation became irregular and excessive, and the general health failed. The discharge and abdominal pain persisted. When first seen by Dr. Cartledge, August 23d, the vagina was found filled with a growth of a bluish-purple color, but owing to the extreme sensitiveness of the patient a satisfactory examination was impracticable. In consultation, he expressed the opinion that the growth was an ordinary submucous uterine fibroid. August 25th, Dr. Cartledge found the tumor attached by a thick pedicle to the posterior vaginal wall, and extending to the vault to press upon the cervix uteri. The os uteri was sufficiently dilated to admit two fingers. The tumor was turned out from the vagina, its pedicle ligated, and the mass removed with the *écraseur*. The vagina was washed out with carbolized water and an iodoform dressing applied to the stump. Recovery proceeded without incident, the ligature coming away on the sixth day. The tumor was the size of a fist, and microscopical examination proved it to be a fibro-sarcoma containing both round and spindle cells. Dr. Cartledge remarks that vaginal tumors of the sarcomatous variety are rare, especially those that are pedunculated, he having been able to find but two others of the latter class recorded. Brûshy¹²¹⁷ says: "Sarcoma of the vagina, as is proved by Sängers' case, may develop in a similar manner to the rare forms of papillary sarcoma of the cervix into polypoid papillary excrescences." Sängers' case occurred in a child, and as there were a number of small pedunculated tumors, but rather of a papillary type, Cartledge thinks it can hardly be classed as an example of pedunculated sarcoma. The other case was that of Bazardy. "This patient was twenty-five years old, of healthy parentages. At the fifth or sixth month of her first pregnancy she began to have the sensation of a foreign body in the vagina, attended with pain while at work, which was so severe by the end of the eighth month that she entered the hospital, where it was ascertained that she had a tumor about the size of a hen's egg attached by a pedicle to

the posterior vaginal wall. This was removed and proved microscopically to be a round-celled sarcoma. Three months after delivery there appeared two broad-based tumors in the posterior vaginal wall, the larger the size of a hen's egg. They were extirpated by the galvanocautery without hæmorrhage. The tumor slowly recurred, the glands throughout the body became affected, and there was metastasis in the skin and mammae. The patient died in eight months of peritonitis. No autopsy. Microscopical examination of the large vaginal growth proved it to be a round-celled sarcoma, while the smaller was spindle-celled.

According to Cartledge, the few cases of sarcoma in the vagina so far observed have taken the form of rounded tumors or of disseminated infiltration of the vaginal wall, six cases having occurred in children from two to five years old. He quotes Brûshy as stating the oldest adult case to be that of Spiegleberg's second case, aged fifty-eight. Spiegleberg's first case, "a circumscribed fibro-sarcoma of the lower portion of the anterior vaginal wall, size of a walnut, was extirpated and pronounced by Waldeyer a spindle-celled sarcoma. Four years after there was no recurrence." This, says Dr. Cartledge, is the only authentic case where sarcoma of the vagina has not returned after removal. The other two cases of non-recurrence reported were not observed sufficiently long after operation. He seems inclined to the belief that the pedicle in his case being almost purely fibrous would favor non-recurrence. In stating that Spiegleberg's first case (sarcoma of the vagina) was the only one in which there was non-recurrence after removal Dr. Cartledge seems to have overlooked that of Volkmann above noted, and their views are somewhat at variance as regards the number of cases reported.

Cysts of the Vagina.—A case of cyst of the vagina occurred in the practice of Richelot,¹⁷_{Oct. 16} at the Hôpital Tenon. It is well-known that the cysts are divided into superficial and deep, the first varying in size from a lintel to a hazel-nut, sessile or pediculated, with thin walls and with contents of aropy consistence. Generally multiple, these superficial cysts are most frequently observed on the anterior vaginal wall. The deep cysts, ordinarily single, are situated under the mucosa and attain to more considerable proportions than the former. It is rare, however, for their size to exceed that of a pullet's egg. The case now to be described is of the deep variety.

Jeanne C., aged thirty-six years, entered the service of Dr. Richelot, March 2, 1888, with a tumor of the vagina, the beginning of which dated back two years. Sexual congress was not at first impossible. The tumor appeared at the vulva, and was spontaneously reduced when the horizontal decubitus was assumed. Since the appearance of the tumor two pregnancies have taken place. The first began at the time of the appearance of the tumor, which rapidly increased, and attained its maximum toward the close of that pregnancy. The tumor was not then spontaneously reducible, and the patient was forced to wear a pessary. After delivery the tumor diminished in size, but became again enlarged during the next pregnancy. More and more annoyed by this affection, the patient decided to enter the hospital. The tumor, which appeared at the vulva, was pyriform, with large posterior extremity. Its long axis measured twelve to fourteen centimetres, its short axis transverse four to five centimetres. Its surface was smooth and pale, and the tumor elastic and fluctuating. When punctured it emitted a viscid, ropy liquid. The bladder was emptied naturally. No trace of either cystocele nor rectocele. The cyst was reducible by general pressure in the vagina. Once reduced, it filled the left lateral *cul-de-sac* and occupied the anterior, posterior, and lateral walls. It protruded when the patient rose. M. Richelot made an incision following the long axis of the cyst. This was opened. Its wall, thickened by three to four millimetres at the upper part, from five to six at the lower part, was dissected with difficulty from the vaginal mucosa. The cavity of the cyst presented points of constriction, and there was a tendency to multilocularity.

Cicatrization progressed rapidly, but the vaginal walls, having been long distended, became considerably prolapsed. Richelot then did a colpoperineorrhaphy, which retracted the orifice of the vulva and the cavity of the vagina. Histological examination proved that the walls of the cyst were composed of two layers—the most considerable, the external, made up of bundles of fibrous connective tissue, elastic fibres, and smooth muscular fibres. The internal layer was formed of cylindrical epithelium with straight elongated cells, with a nucleus at their base. The nature of the epithelium afforded sufficient explanation of the nature and development of the cyst, a subject concerning which authors have expressed very different opinions. Verneuil suggests that deep cysts of the vagina

have an origin analogous to accidental serous bursæ; but if such be the case should we not always find pavement epithelium on the cyst-wall? Other authors, Virchow among the number, claim for these cysts a glandular origin.

Winkel asserts that they originate from sanguineous exudation, hæmatomata developed in the vaginal wall, and become encysted. Neither the contents nor the structure of the walls of vaginal cysts give sufficient reason for such theory. The most plausible theory appears to be that deep cysts of the vagina are developed at the expense of the ducts of Gärtner, which, under certain circumstances, may persist up to adult life. The existence of cylindrical epithelium gives great weight to this view.

Lapeyre²⁴_{Nov.11} publishes a case of a pregnant woman who had a cyst of the size of a small apple springing from the anterior vaginal wall by a pedicle the size of a thumb. Cystocele, hæmatocele, and enterocele were excluded from the diagnosis, leaving that of vaginal cyst as the only one borne out by the symptoms and signs. The tumor protruded below the labia on assuming the erect position. The treatment consisted of rest on the back and the administration of tonics. At the time of labor the head was found to be arrested by the cyst, and in order to accomplish delivery the cyst was punctured, allowing the escape of about three fluidounces of greenish-black fluid, after which the child was enabled easily to pass. Pyæmic symptoms developed, but the patient ultimately recovered, the cyst at the time of reporting being quiescent and still empty—two years.

Gas-Cysts of the Vagina.—Piering²⁵_{Oct.20} describes a case of gas-cysts of the vagina in a pregnant female under Schauta's care. There were numerous cysts, on the puncture of which an odorless, colorless gas escaped. A cure followed the removal of a portion of vaginal mucous membrane, including one of the cysts, by which means the lymph-system of the part was drained. Histologically the cyst-walls were found to consist of dilated lymph-spaces.

Zweifel⁵⁷_{Apr.15} reports a case of colpitis emphysematosa, where there was a cyst containing a gas which proved on examination to be trimethylamin.

Foreign Bodies in Vulva and Vagina.—Bókai²²_{Aug.29} has related a case of strangulation of the clitoris in a young girl, produced by her having tied a piece of string about its base fourteen days

prior to her coming under his notice. The parts were much swollen on the distal side of the constriction. As the size of the organ remained that of a hazel-nut for some time after the parts had otherwise attained a normal condition, partial ablation of the clitoris was performed.

G. T. Bartlett⁶⁵_{Oct.} had under his care a maniac in whom two abscesses were found about the genitalia, one at the side of the labium, the other in the perinaeum, due to the presence of the presenting points of a hair-pin, the bend of which was found higher up in the rectum. It was delivered by version of the bend through the rectum, and was found to measure three and one-half inches.

J. Rouvier²⁶_{Oct.} has collected a long list of foreign bodies found in the vagina, including pessaries, bobbins, bottles, wood, sponges, pomade-pots, lecches, fragments of syringes, hair-pins, hens' eggs, instruments of surgery, etc., to which he adds another observed by himself—a citron. Alloway⁴⁷⁶_{Jan.} had a patient at his clinic whose entire urethra had been torn away at a previous labor, leaving at the neck of the bladder an orifice large enough to admit the finger. Orłowski³³⁶_{Nov. 17} reports a case of gangrene of the mucous membrane of the bladder following dysentery in a three-year-old girl, the gangrenous portion coming away through the urethra.

Streptococcus of the Vagina.—M. E. Legrain¹⁸⁴_{Sept. 1} describes accurately a streptococcus found in the vagina and on the cervix, which was non-pathogenic, and which should be considered in studying the etiology of cases of puerperal infection.

URETHRA.

Periurethral Sarcoma.—C. Thiem,³¹⁷_{p. 701} in a paper read before the German Gynaecological Society, narrates a case of the above affection in a woman aged fifty-six. The tumor was the size of a green walnut, quite firm, and permeated through its upper portion by the urethra. The carunculous nature of the skin was visible in the enlarged vestibule in which the prepuce of the clitoris appeared, though almost obliterated. The clitoris itself was altogether merged into the tumor. The substance of this tumor was composed of epithelioid cells of different sizes, with distinct nucleus, and of connected-cell groups, almost encapsulated by surrounding intercellular connective tissue in all stages of development.

The layers nearest the skin and urethra being of normal structure excludes the possibility of these organs or their glands being the point of origin of the tumor; this must be sought for in the endothelium of the lymph-spaces. The tumor was a sarcomatous formation of the connective-tissue group.

Melanotic Tumors of the Genital Organs.—Haeckel⁹⁵_{B4.32,H.3} has reported from the practice of Braun a case of melanotic tumor in a woman, aged sixty-nine, who had had six children and two miscarriages. She had noticed a small growth in connection with the genitals eleven months before coming under observation. The growth gradually increased in size, and some months later the left inguinal glands became involved, and a few weeks later the right. A feeling of obstruction in the vagina was the only disturbance complained of. Upon examination a tumor was observed of the size of a child's fist, dark blue in color, with white streaks, and involving the entire left labium minus, the clitoris, and the upper portion of the right nympha. The tumor was removed, together with the glands in both groins, the lymphatic tracts on either side, and the adipose tissue of the mons veneris. The patient recovered rapidly from the operation, but died five months after with symptoms of secondary malignant disease of the liver and other organs. Microscopic examination proved the labial growth to be a small, round-celled sarcoma with abundant pigment-cells and pigment-granules. Haeckel has collected the published cases of melanotic tumors of the external genitals, of which he states there have been thirteen, most of these having proved fatal within two years after the commencement of the disease. Only two have been reported in which there has been no recurrence after excision at the expiration of three years. The case of C. J. Mueller is reported to have been free of induration of the inguinal glands at time of operation. He thinks there is little difficulty in the diagnosis of these tumors, care being observed to avoid confusion between a melanotic growth and an ordinary sarcoma into the tissues of which there has been repeated hæmorrhage.

Primary melanotic tumors of the uterus are rare, and neither the ovaries nor the vagina have been known to have been visited by primary growths of that character.

Dilatation of the Urethra in Puerperal Ischuria.—Schatz³¹⁷_{p.304} submitted to the German Gynæcological Association a paper

on this subject. He called attention to the occasional retention of the urine after labor and the liability to cystitis as a result of the usual resort to catheterism; and, instead of the repeated introduction of the catheter, he effects a single dilatation of the urethra with an instrument constructed on the principle of the glove-stretcher. The urethra is dilated to the size of a slender little finger. Usually a slight bleeding occurs, and the pain is moderate. Spontaneous urination follows and no further trouble eventuates. Occasionally a second stretching is necessitated, and in very rare instances the procedure is an entire failure. Schatz thinks that dilatation will displace the practice of catheterization after labor when its advantages become generally known. The advantages claimed are the lessened risk of cystitis, less annoyance to the patient, and the necessity usually of only one application in practice. He advocates the extension of the procedure to spastic retention following abdominal action, operations on the uterus, etc. Schatz's advocacy of this measure, under the conditions above indicated, is based upon ten years' experience. I recognize the advantages connected with the procedure, especially the greatly diminished risk of cystitis, which, when dependent upon catheterization, especially after labor and after operation on the uterine cervix or the external genitals, is usually septic in character, and may place the patient's life in danger from extension of the inflammation to the ureters and to the kidneys. Of course, the dilatation should be done under aseptic conditions. The genitals should be thoroughly cleansed with corrosive sublimate douching, and the dilator, etc., should be rendered aseptic. With these precautions, and not making the dilatation too great, I cannot see that the procedure can be attended with any risk. Moreover, an important fact is that the stretching is done by the physician while catheterism is done almost of necessity by the nurse, whose observations of the law of cleanliness cannot be relied upon in most instances.

Urethrocele.—At the last meeting of the American Gynecological Society, Thomas A. Emmet ⁵⁰_{Sept. 22} submitted a communication in which he stated that urethrocele was not dependent upon a laceration of the perinæum, inasmuch as it never occurred after a rupture through the sphincter ani and the rectovaginal septum in a primipara if such injury was the only other one.

It exists, according to Emmet, only after a serious double

laceration of the cervix, and generally in those who have borne several children. The labor has been either rapid or tedious, more frequently rapid. The injury to the urethra is limited to the lower or vaginal part. The upper portion, *i.e.*, the portion under the pubic arch, escapes, except when from great and prolonged pressure the entire circumference sloughs off. An ample pubic arch, though favoring the descent of the head, yet renders the urethra more liable to injury and to subsequent urethrocele. As the head descends, the lower portion of the urethra is pushed downward and the portion in advance of the head becomes dilated by the crowding into it of the loose mucous and submucous tissues of the urethra near the bladder. Also, longitudinal lacerations occur along the urethral mucous membrane of varying depth, in one instance observed by Dr. Emmet extending through into the vagina. Urethrocele or dilatation of the urethra should not be confounded with an apparent thickening of the urethral wall that also follows labor. The latter is a prolapse of the urethra and not a dilatation. In true urethrocele there is sacculation, with shortening. Both extremities of the urethra may be narrowed from cicatrization, while from partial retention of urine within the urethra the sacculation eventuates. The symptoms dependent upon this condition may be attributed erroneously to the bladder, uterus, or rectum. Dr. Emmet described his method of operating as follows: The patient is on the left side and a Sim's speculum is introduced. A No. 12 block-tin sound is now carried into the urethra. This had been bent so that it would not easily slip out, and it is held by an assistant. The prolapsed tissue is pushed back into the bladder with the sound. He now steadies the centre of the urethrocele with a tenaculum, and with scissors bent at an angle he cuts down upon the sound. The incision is extended toward either end of the urethra, but not so far as to involve either the neck of the bladder or the meatus urethrae, so as to preserve retentive power and also the urethral outlet. He now draws out the excess of the mucous and submucous tissues and cuts it off, but leaving enough tissue to cover the sound. Thus the pouch is obliterated. Then the urethra is drawn out its full length by means of tenacula, one inserted into either end of the incision. Now with intercepted fine silk sutures the vaginal and urethral mucous membranes are brought together around the wound. The urethra is thus restored to its normal

length and its calibre rendered of uniform size. The urethral vaginal fistula, thus secured, is not closed until the symptoms indicate that the thickened and congested mucous membrane of the urethra has returned to nearly a normal condition. Dr. Emmet emphasized the fact that very many cases of urethrocele are not recognized, and that his operation for the cure of the condition has not received sufficient attention. In the discussion following this paper, A. J. C. Skene stated that he had found that dislocation or tearing of the urethra away from its supports during labor occurs more frequently than the sacculated condition, and that transverse or longitudinal laceration of the urethra or its mucosa must be rare, for he had never met with one. Both Dr. Skene and William T. Lusk spoke in high praise of the operation in the true sacculated urethra. There is no incontinence following the operation, and the patient becomes so comfortable that she not infrequently declines to have the operation for closure of the opening made. Priestly, of London, called attention to the occasional existence of a urethral cyst due to distention of a sebaceous follicle.

The explanation, as given above by Dr. Emmet, of the causation of urethrocele in most cases, does not accord with the views of Nathan Bozeman,⁶¹_{Sept. 29} who ascribes the sacculation of the urethra to its partial obstruction at or near the meatus. The increased effort to overcome the obstruction eventuates in the dilatation of the calibre of the urethra above the stricture. Bagging of the urethra toward the vagina follows, inasmuch as the urethral wall has normally less support in that direction. Bozeman finds that cystitis is usually associated with this condition, and recommends the making of a vesicovaginal fistula for the relief of the pathological condition of both urethra and bladder.

I believe that the views as to the causation of urethrocele held by these two distinguished and experienced surgeons are correct, inasmuch as sometimes one, sometimes the other, method of formation of the sacculation has obtained. As to treatment, whenever the diseased condition is not complicated with marked cystitis, the "button-hole" operation of Emmet on the urethra is to be preferred, as it does not produce incontinence, will relieve the symptoms dependent upon the urethrocele, and, by restoring a healthy condition of the urethra, will tend to improve the condition of the bladder if this viscus is not extensively inflamed.

Piedpremier²¹²_{July} defines a urethrocele to be simply a dilatation of the inferior wall of the urethra and its hernia into the vagina. He states that it may be simple or complicated. The usual complications are hernia of the vaginal mucosa, cystocele, and uterine prolapse. Among the etiological factors he cites age, forty to fifty years, and labor, especially difficult labor. After some disturbances of micturition of variable duration, a change occurs in the character of the urine: it becomes thicker, clouded, and deposits mucus. The urine also becomes irritating, and produces erythema of the vulva and thighs. Gradually the patient becomes cognizant of a tumor developing in the vagina, later protruding into the vulva, and subjected to alternate distention and collapse. Palpation reveals a tumor varying in size from that of a hazel-nut to that of a chicken's egg, somewhat rounded, fluctuating, covered with the vaginal mucous membrane, and sometimes painful to the touch. According to Piedpremier, it is sufficient in some cases that the patient empty the bladder with a catheter with the view of preventing the filling of the urethrocele. In more severe cases an operation is necessary. This may be either a simple incision or a resection or excision of the tumor if it is of large size.

Appreciating the frequency with which cystitis is caused by the repeated use of the catheter, I cannot indorse Dr. Piedpremier's advice as to the use of that instrument in the treatment of urethrocele. The altered mucus of the urethra would be thus carried into the bladder, and its inflammation most probably established.

Rodent Ulcer of the Urethra.—Theodore Landau⁹⁵₁₈₁₋₃ reports five cases of rodent ulcer of the urethra. In four of these the patient was syphilitic and the fifth was probably so. The course of the disease is chronic, there is limitation to the urethra, and there is no tendency to cicatrization. The diagnosis rests upon these facts. In its early stage symptoms are almost entirely absent. The microscope differentiates the condition from all new growths, as tuberculosis, carcinoma, etc. The prognosis is not unfavorable as to prolongation of life, though in the later stages the bladder becomes involved with eventual extension to the kidneys and a fatal termination. There is not much prospect of cure. The most that Landau effected was to limit the extension. For this purpose he resorted to curetting with cauterization, lactic acid being preferred for the latter purpose. He found antisymphilitic remedies unavailing.

I would suggest excision of the affected portion of the urethra as probably the proper procedure. Incontinence would not follow excision unless the portion next to the bladder were included in the operation.

Laceration of the Urethra.—Alloway¹⁷⁶_{Jan.} reported a case of a primipara who had been suffering with incontinence of urine for four months and whose youngest child was five years of age. There was no trace of the normal urethra, but instead a loose flap of thickened tissue about one inch long and half an inch in width. When this was held out of the way the opening into the bladder could be seen and the finger was readily introduced into that viscus.

Dr. Alloway thought that the laceration must have occurred during one of her labors and probably during the use of the forceps. He proposed to repair the urethra in two operations. In the first one he intended to repair one side only, and by keeping the patient on the opposite side to prevent the urine flowing over the surfaces approximated, and in a second operation he would unite the other side. He refers to a report of similar cases given by Braithwaite.²_{Dec. 3, '87}

Urethral Caruncle.—F. A. Castle,¹_{Mar. 17} in an article on urethral caruncle, states that in most cases this condition is nothing more than a varicose condition of the veins of the urethra; in fact, a urethral hemorrhoid. When of small size they usually produce no symptoms, but when overdilated or inflamed they cause more or less suffering. He further states that a small percentage of caruncles are of the nature of a mucous polyp—like those occurring in the mucous membrane of the lower rectum or of the nose, especially in children.

When the patient is examined by Sims' method, which favors emptying the urethral veins, enlarged urethral veins may escape observation. Dr. Castle says that the same principles adopted in the treatment of hemorrhoids of the rectum are applicable in the treatment of the usual form of caruncle of the urethra. In catheterizing a patient with dilated urethral veins, he advises that as the catheter is being withdrawn the pulp of the finger should be pressed against the proximal orifice of the urethra so as to retain urine in the catheter and to thus prevent the dilated vein dropping into the fenestra in the catheter, which, if occurring, is productive

of pain. He recommends the universal resort to this procedure after labor if catheterism is necessitated, as then the veins are very apt to be varicose. I would supplement this advice with the statement that the orifice of the catheter should be always thus closed with the finger when withdrawn, otherwise a small quantity of urine will flow from the distal extremity over the external genitals and possibly over a lacerated surface. Better still would be Schatz's method of dilating the urethra, thus avoiding repeated use of the catheter.

John G. Perry^{v.47,p.234} discussed the subject of urethral caruncle before the Alumni Association of the Woman's Hospital of New York. He describes the caruncle as elongated, of a scarlet or bluish-red color, spongy in texture, marked with shallow indentation, and covered with epithelium; or as a single, round tumor, at times in a cluster, bleeding readily and irritable; or again as a conglomeration of mucous membrane, cysts, and vascular tumors, with new formations crowded together and climbing upward along the urethra. The latter variety is the most formidable, and may attain almost any size. Dr. Perry considers chronic urethritis with proliferation of the underlying connective tissue as the most important etiological factor. He quotes Wedl as regarding the caruncle as a papillary new formation of connective tissue. Perry ascribes the appearance of the caruncles about the meatus rather than higher in the urethra to the action of the muscular apparatus of the urethra in propelling the caruncular masses toward the outlet. He emphasized the absence of cystitis in the causation, but the urine is of a high specific gravity and contains much uric acid.

In the treatment this condition of the urine must be rectified. As a part of the caruncle there had developed new nerves and new blood-vessels. The communications of Castle and Perry go to show how indefinite is the term urethral caruncle as understood by various writers and operators.

Urethral Calculus.—Schatz⁶⁹_{July 19} reported a case of a girl of eighteen years, who introduced a hairpin into the urethra with the bent portion uppermost. This remained in the urethra for six months with lancinating pain, frequent urination, but without incontinence. Violent tenesmus occurring, relief was sought. Examination by an assistant of Schatz showed what seemed to be

a large stone in the vagina. On the following day, during a violent straining, the stone was expelled. It measured eight centimetres in length and fourteen in circumference, and weighed one hundred grammes. Within the stone was the hairpin. From the knobbed shape of one extremity it was thought that at first it was limited to the urethra, but it increased in size until a knobbed extremity formed in the bladder. When the meatus was sufficiently dilated by the growth of the calculus, it was extruded with laceration of the vesical sphincter; a fistula had not formed. Schatz effected continence at once with his funnel-shaped pessary. He was desirous of knowing if excision at the sphincter vesicae would secure permanent continence.

Vesical Calculus.—Milevsky⁵⁸⁶_{No. 9,30} reports the case of a multipara who presented symptoms indicative of intense cystitis, with prolapse of the rectal mucous membrane. She had passed through a normal though sluggish labor, with a large child, a few weeks previously. The sound revealed a large, rough stone imbedded in the vesical mucous membrane just behind the neck of the bladder. Because of the size and relation of the stone, lithotripsy was deemed dangerous, and colpocystotomy was performed. An incision three centimetres in length was made, extending downward from a point three centimetres below the uterine cervix. The stone could not be detached and removed through this opening. The incision was lengthened, and it was also necessary to make a cross-incision. After removal of the calculus the incisions were closed with eight silk sutures. Union failed to occur, and about five weeks later Milevsky closed successfully the large fistula with silver and silk sutures. The latter operation was done with one grain (0.065 gramme) of cocaine introduced under the mucous membrane. The stone weighed one hundred and forty grammes, and measured 6.9 centimetres in length, five centimetres in breadth, and 14.5 centimetres in circumference, and consisted of phosphates as a nucleus with a thin layer of exanthin. Milevsky calls attention to the fact that his patient had been recently delivered of a large foetus without injury, though the stone was of unusually large size, and he considers the case as unique in this respect. He cites cases of Guillemeau, Bourgeois, Lowdelle, and Aveling, in which the parturient suffered considerable injury. In one case, the mother dying, an unsuspected vesical stone weighing two hundred grammes

was found. In another case Dubois and Hugenberg delivered the fœtus with forceps, and Dubois subsequently removed the stone. Monod, Heppner, and Hugenberg, each in one case, removed the stone during labor by colpocystotomy. Milevsky expresses the opinion that in most instances lithotripsy is the best procedure, but that with some complications, as in his own case, colpocystotomy or suprapubic section will be the best. He states that Podrazki and Dianin recommend vaginal lithotomy, even in uncomplicated cases, and Slaviansky believes that this operation can well compete with lithotripsy. Milevsky states that the most extensive vesicovaginal fistula can be closed painlessly under cocaine.

Voins, of Odessa, ⁹⁶_{Dec.} reports a successful 'suprapubic lithotomy in an extremely weak girl of eight years. He removed three stones, together weighing 26.5 grammes, and measuring two and one-quarter to three centimetres in diameter.

Uretero-Vesical Fistula.—The increase of surgical skill in dealing with the ureters is well exemplified by two cases operated upon, one by Herrgott, ¹⁰_{May} and the other by Bozeman, ⁵_{Mar.} Herrgott's case was one of vesico-uretero-vaginal fistula resulting from labor five years before, and situated in the anterior vaginal wall. It was oval in outline, a little more inclined to the left than right, its long diameter (transverse) measuring four centimetres, its shorter diameter twenty-five millimetres. There was prolapse of the vesical mucous membrane through the opening, reaching so far forward as to protrude from the vulva on straining, and to act as an effectual plug in the fistulous opening. The left ureteral opening was easily found. The operation was performed in the dorsal position. A univalve speculum having been introduced into the vagina, a small bougie was passed into the left ureter, which was then dissected out of a bed of cicatricial tissue for a length of twelve to fifteen millimetres. The edges of the fistula were freshened and brought together by sutures. The patient recovered perfectly with the exception of a small vesicovaginal fistula, which later became closed. Bozeman's case was one of chronic pyelitis on the right side, cured by "kolpo-uretero-cystotomy," followed by frequent catheterization and irrigation of the affected renal pelvis by means of a fine catheter (the size being later gradually increased) introduced through the artificial fistula. After six

weeks of catheterization and irrigation the urine obtained from the right kidney was found to be normal in character. The evil effects of the fistula were warded off, while at the same time an existing retroflexion was corrected by means of the operator's "utero-vesical drainage support." The urine having remained normal for four and a half months, the fistula was closed. Five weeks after the reparative operation the patient had had no return of her symptoms. Bozeman tried a sound composed of a spirally twisted ribbon of metal for the detection of renal calculi and met with complete success, although no calculus was detected in this particular case.

Catheterization of the Ureters and its Value in the Treatment of Urinogenital Fistulae.—Jacob, Jr., of Brussels, ¹⁸⁶²_{Oct. 22} agrees with Pawlite that "in many cases catheterization of the ureters is often useful and sometimes necessary." He says the ureters run obliquely in the bladder-walls for about two centimetres, and open by an orifice of about four to five millimetres in length at one of the posterior angles of the trigone. The two orifices are two to two and one-half centimetres apart, and about two to three centimetres from the urethral orifice. Anomalies of this triangle are found, and it is difficult to determine the relative position of the uterine neck, vagina, and ureters because of the mobility of the ureters in the bladder-wall. The orifice of the ureter is usually about thirty millimetres from the base of the vaginal uterine neck, and twenty-five to thirty millimetres from the *os tincæ*. But these measurements are not fixed. The patient should be in the genupectoral position, as in this position air enters the bladder during the introduction of the catheter and facilitates catheterization of the ureters.

Jacob uses Simon's speculum, which raises the posterior wall and brings into view the outer wall. If the bladder is empty the catheter meets with resistance from the uterus. The injection of fluid into the bladder gives greater room for the movement of the catheter and effaces the folds of the mucous membrane. If too much fluid is introduced, the orifice of the ureter becomes stretched as a narrow slit, and a slight swelling is produced which causes the sound to become deviated. One hundred and fifty to two hundred grammes (three pints to three pints and twelve ounces) of water is sufficient. With this amount of fluid the

ureteral orifices correspond very nearly with the points of guidance to be found in the anterior vaginal wall. In this wall can be seen two diverging lines leading from the urethral vesical orifice to a transverse depression in front of the uterus.

This triangular space indicates the position of the trigone, especially if the bladder is moderately distended. The orifices of the ureters are at the angles nearest to the uterus. The speculum should be of moderate size. The catheter of Pawlite when introduced should cause a swelling along the vaginal wall so that its course can be watched with the eye. The catheter should be carried along one side of the triangle and at the same time be partially rotated on its axis. The ureter is entered at the distance of about two to four centimetres. When the sound enters the ureter, its lateral movement becomes impossible. There also occurs an intermittent escape of urine from the catheter. While the catheter is in the ureter, if a colored liquid is thrown into the bladder, clear urine will continue to come through the catheter. Catheterization of the ureter is quite painless unless the vesical mucous membrane is diseased. When such is the case, morphia or cocaine should be previously thrown into the bladder.

Vesicovaginal fistulae are most numerous in the median line because the bladder and the vagina are most intimately blended at that point, while laterally they are loosely connected by an intervening layer of connective tissue. The fistula of labor occurs when the head undergoes rotation to place the occiput under the pubes. Owing to the mobility of the ureter it may be involved in a fistula, even when the injury to the vaginal wall is so placed as to lead one to suppose that the ureter had escaped involvement. The most vulnerable part of the ureter is that portion in the bladder-wall.

PERINEORRHAPHY.

As regards the subject of perineorrhaphy, there has been nothing much added to previous literature except for important results from the use of Lawson Tait's flap-splitting method⁴⁹ and referred to by me in vol. iv of the *ANNUAL* of 1888. The propriety of his claim as originator of the flap-splitting method has been vigorously questioned. Tait certainly did much to popularize the method, if he did not originate it. The operation is highly spoken of by Zweifel, Säger, Frauk, and Olshausen. Roki-

tansky ⁸⁴_{Nov.3} gave a *résumé* of his experience with Tait's method, and believes that the operation is only one of "propping up." He remarked the occurrence of partial gangrene in two of his cases, and thinks the result by far more unfavorable than that which he is accustomed to obtain by other methods. Riedinger ⁸_{Sept.27} reports four cases operated upon by Lawson Tait's method. His first case was one of vesicocoele, bilateral laceration of cervix, and perinaeum torn half of its extent. Here the cervix was amputated and an anterior colporrhaphy made, followed later by Tait's operation, the latter converting a perinaeum 2.5 centimetres in length into one of six centimetres, which was later reduced to five centimetres by the healing and by the perishing of a small portion of the newly-constructed frænulum. His second case much resembled the first, the result being perfect and no sloughing occurring. His third case was one where, following labor, there was complete incontinence. A plastic operation was performed with but partial success, Tait's flap-splitting operation being later performed with complete success, the patient having absolute control of rectum and bladder. His fourth case was one of vesicovaginal fistula and laceration of perinaeum. The fistula was first closed and later Tait's perineorrhaphy was performed with success. He sums up the advantages derived from this method of operating thus: It is easily accomplished, hæmorrhage is slight, the result is satisfactory, the perinaeum is a long one, the restoration of the septum is abundant, primary union follows, and the patient can get up in two and a half weeks.

Winiwarter ⁸_{Nov.1} reports nine cases operated upon after the method of Lawson Tait, including two cases of incomplete rupture of the perinaeum, six cases of complete rupture of the perinaeum, and one case of prolapse without perinaeal rupture. All of the cases operated upon were cured. Primary union occurred in one of incomplete rupture, in four of the cases of complete rupture of the perinaeum, and in the case of high-grade prolapse without rupture. In the two remaining cases of complete rupture the line of union separated to a small extent (in neither more than one-third), and healed "per secundum." In one case of incomplete rupture a second operation was necessitated by sloughing. He accredits the discovery of the method to A. R. Simpson, of Edinburgh.

DISEASES OF PREGNANCY.

By THEOPHILUS PARVIN, M.D., LL.D.,

PHILADELPHIA.

STERILITY.

THE statement of a distinguished American gynæcologist to the effect that he had never seen a case of a woman who bore a child after she had gonorrhœa has elicited much comment. W. R. Smith⁵⁹_{Feb. 4} states that he has had a number of instances in which he treated both husband and wife for gonorrhœa, and they afterward had healthy children. Unfortunately, he adds, "Unless the disease has affected the ovaries, there is certainly nothing to prevent conception." It would be much more in accordance with what is known of the pathology of the uterine appendages to say that if there has been no gonorrhœal salpingitis the woman may conceive. To this may be added the evidence of a cloud of medical witnesses who testify¹⁵⁹_{May} that many women after having had gonorrhœa have borne children.

S. Louise Weintraub, in a paper¹⁹_{Jan. 21} upon "Sterility. Especially in Syrian Women," states that frequently a small and undeveloped uterus is the cause, and that the treatment she usually found most successful was dilatation with sea-tangle tents.

Artificial Fecundation.—Mantegazza¹⁵⁴_{Dec. 15, '87} regards this as indicated in the following conditions: (1) in hypospadias; (2) if the penis be very short; (3) in case the spermatic fluid is not ejected with the necessary power; (4) when fecundation is prevented by an anomaly of position of the uterus or by considerable narrowing of the cervical canal; (5) the failure of dilatation of the cervical canal is not a contra-indication; (6) in all cases, without dysmenorrhœa, where the cause of the sterility is unknown.

Ample scope is thus given, especially by the last indication, for all who wish to engage in this sort of homoculture. The author advises the eight days following menstruation as the most favorable time, and should failure occur, the trial may be made before the next menstruation. Roubaud's syringe is used, and

(H-1)

three intrauterine injections are made, the woman remaining recumbent for a day. Should the wife object to professional intervention, the husband is supplied with a syringe and instructed in the entire method, and thus there is opened a new field for marital industry!

ABORTION.

Etiology.—Pradel, ²⁴_{v.15,p.428} discussing the question of the effects on pregnancy of the occupation of cigarmaking or other employments involving the constant manipulation of tobacco, cites the case of a healthy married woman, her husband also being healthy, who in three years had three pregnancies, one ending by abortion at two months, and the other two by premature labor, the fœtus being dead. The author refers to the discordant professional opinions upon the subject, and suggests that new researches are necessary to decide the question.

Poole, ⁶²_{July 2} while attributing to malaria the power to interrupt pregnancy, believes that in some cases the quinine given for the cure of the manifestations of the former is the cause. He further remarks: "I have treated several cases of abortion that were caused by the woman picking cotton in her apron, which was tied around the waist, and left to hang in the shape of a bag over the distended abdomen. The combined weight, heat over the abdomen, and friction, together with the peculiar position of the woman, were perhaps the cause. There is one other cause in these cases which, although it may seem far-fetched, can come in as a supposition—the constant inhalation of the odor of cotton-seed and of the cotton-plant, especially after it has been nipped by the frost. By thoroughly impregnating the system with these odors the oxytocic effect may have been sufficient to produce abortion."

Treatment.—Misrachi, ²³⁶_{Aug.} strongly advocates the employment of the *écourillon*, that is, the method of Doléris, in the treatment of incomplete abortion, and reports a number of successful cases. He observes: "Antisepsis was very carefully conducted before, during, and after the operation; creasote for the *écourillon*, vaginal injections of sublimate, and boracic irrigations of the uterus, iodoform upon the cervix, and a tampon of iodoform and glycerine in the vagina." Nitot, ²¹_{v.15,p.72} also advocates *écourillonnage* after incomplete abortion, followed by curetting of the uterine cavity.

Henry D. Fry, ²⁷_{v.21,p.593} advocates the use of electricity as a substi-

tute for the curette in incomplete abortion. He remarks as to the latter, that "its action cannot be limited to the tissues we wish to remove, but it will 'scrape healthy tissue' also." For the immediate removal of retained secundines the faradic current is employed, but for the removal of these after retention for some time, the galvanic. He reports a case in which the latter current was used successfully, the strength being sixty milliamperes, and the application continued for eight minutes and repeated three times. The positive pole was introduced into the uterus, the selection being made because of the local effect, because this pole promotes coagulation, and because it is hæmostatic; a fourth reason is added as probable, but not proved—its antiseptic powers.

Misrachi,⁴⁸ referring to the claim made by Cordès for the eccholic action of quinine, remarks as the result of his own experience: "In place of saying, as Cordès has, that quinine is preferable to instrumental intervention in many cases of abortion, I will say that one loses nothing in trying it, but it will be most frequently found inefficacious."

Lawrence¹³¹_{Mar.} gives the following as his practice in incomplete abortion: "Put the patient on her left side, Sims' position; wash out the vagina with carbolic lotion, one in one hundred; pass a duck-bill speculum; take hold of the anterior lip of the cervix with Sims' hook, and pass up into the uterus a bougie of twenty grains of iodoform; then one of my antiseptic and gelatine-coated sponge tents—retain this in the cervix uteri by a piece of iodoform wool in the vagina. In from twelve to twenty-four hours see the patient again, remove the vaginal plug and the sponge tent, both of which will be perfectly aseptic; wash out the vagina with the carbolic lotion, and now pass the finger into the uterus, and very likely you will be able to reach the fundus and clear out the contents. After this, wash out the uterus with the carbolic lotion, and give directions for the vagina to be daily syringed with the same lotion. Sometimes it is almost impossible to pass the finger up to the fundus to clear out the uterus; in these cases a good plan is to partly retrovert the uterus, and then, with the fundus pressed against the sacrum, it is possible to get the finger right up, and clear out the uterine cavity. The only instrument I use in these cases is a blunt curette, and I very seldom use that. Very often in your manipulations to get

out a piece of ovum you will find great assistance by passing along the side of your finger which is in the uterus a catheter, and injecting hot water."

Protracted Abortion.—Heitzmann¹⁶⁹_{Feb} divides abortions into those occurring during the first six weeks of pregnancy, which are often undetected and rarely dangerous, and those occurring after this period, which may be attended by severe and dangerous symptoms. The course of an abortion resembles that of labor; a period of uterine dilatation, the expulsion of the ovum, followed by the involution of the uterus; when delay occurs in any one of these three stages the abortion is protracted.

The most frequent cause is failure of the os and cervix to dilate, resulting from a rigid condition of the tissues following laceration or previous inflammation. The abnormality present may be closure of the internal os and dilation of the external os and cervix, or closure of the external os while the internal opens. The symptoms will often vary as the fœtus perishes or lives until birth. The gradual separation of the ovum and its appendages may result in repeated hæmorrhage and the accumulation of blood between the wall of the uterus and the ovum, which sinks gradually in the cervix, while the placenta still remains adherent. As Dührssen has shown, when the lowermost point of the fœtus remains above the internal os, at three months' pregnancy, the finger can usually be passed to the insertion of the placenta at the fundus, and if that be separated the ovum and the decidua near will be expelled entire. In cases of repeated hæmorrhage and gradual death of the fœtus, decomposition of the fœtus and its appendages is apt to occur, with septic infection. The ovum may be expelled and the placenta remain; this may be delivered at a succeeding menstruation or in a subsequent hæmorrhage. Failure to promptly expel the ovum and its appendages may cause subinvolution, which is a phase of protracted abortion. Among the causes of abortion the most frequent is syphilis. Pronounced anæmia, producing impaired nutrition of the uterine muscle, is also a frequent cause. Tuberculosis, frequent pregnancy, and parturition and uterine tumors, causing hæmorrhage, also cause abortion. Nephritis is a potent factor, especially when the embryo dies from cellular infiltration of the placenta. Uterus bicornis may predispose to abortion, and Heitzmann relates a case. Endometritis, endocervicitis,

inflammation and adhesion of the placenta and cord and uterine wall, para- and peri- metritis, causing displacements of the uterus, predispose to abortion.

Moses has shown in his analysis of sixty-one cases of abortion that subinvolution following parturition is a most frequent and direct cause of abortion in a succeeding pregnancy. As traumatic causes, the most frequent are the insertion of a sound and the application of caustics in the treatment of injuries of the cervix. Disease of the placenta and membranes, which interferes with the nutrition of the fœtus, indirectly causes abortion. Placental apoplexy, hæmorrhage between the membranes, and disease of the chorion and decidua complete the causes of abortion mentioned by Heitzmann.

The recognition of these causes is important, because they may often be removed by suitable treatment. The diagnosis of abortion in progress is made, not only by the presence of pain and hæmorrhage, but by the softened, enlarged condition of the uterus, the beginning dilatation of the os, and the well-marked line of distinction between cervix and body—a valuable sign of early pregnancy. These signs may be difficult to elicit in a retroflexed uterus. Later in pregnancy the cervix is partially dilated. It may be distended by the ovum, or the internal os may be closed, preventing the descent of the ovum. The stage of expulsion is marked by the bell-shape of the uterus and the funnel-shaped cervix. The cervix may close after the expulsion of the ovum and membranes, leaving the placenta in its cavity. A condition of subinvolution supervenes until the last fragment of membrane or placenta is expelled.

Treatment consists in the use of the tampon to check hæmorrhage. When bleeding ceases it occasionally happens that abortion is prevented, and the ovum goes on to maturity. The material of the tampon should be antiseptic and preferably iodoform gauze. This may be cut in strips one and a half inches wide and six feet long, and, after an antiseptic vaginal douche, should be introduced by forceps, the patient in the knee-chest position preferably, Sims' speculum being used. When the cervix does not dilate it must be opened by artificial means—Hegar's dilators, Ellinger's, or Barnes'. The uterus should then be douched with 3 per cent. carbolic acid. The ovum and appendages should be removed with the finger or

the blunt curette, which is better than the sharp spoon. The cervix should then be engaged in a short speculum and the speculum filled with 5 per cent. carbolic acid. A pledget of cotton on slender forceps should then be passed to the fundus and the endometrium thoroughly cleansed.

In subinvolution after abortion, with repeated hæmorrhage, the use of the sharp spoon and antiseptic intrauterine applications are indicated. Repeated irrigation may be needed in septic cases, carbolic acid being preferred to bichloride of mercury from the dangerous character of the latter.

Clark, of Selma, Alabama,⁴⁰_{June} describes a hook devised by him for the removal of the placenta after abortion. Auvard²⁴ reports a case of a woman who, after an abortion at two months, suddenly died, and it was impossible from any previous symptoms or from the autopsy to explain the cause of death. Elbert Wing²³¹_{June} reports a case of retention of the placenta for five months after an abortion at three months. Hæmorrhage continued after a miscarriage at three months, and to control it ergot was given. At the end of five months of this treatment the placenta was expelled.

VOMITING OF PREGNANCY.

Etiology.—In a paper upon the subject presented the American Gynecological Society by Graily Hewitt,²⁷_{v.21,p.1081} the author analyzed a series of more than fifty cases. These cases exhibited the remarkable frequency with which impaction, incarceration, or detention of the gravid retroflexed or anteфлекed uterus is associated with severe sickness, also the importance of thickening or induration of the cervix. Gill Wylie, in discussing Dr. Hewitt's paper, asserted that most cases of vomiting in pregnancy are due to induration of the cervix—an unproved dogma which few will accept. Jaggard⁶¹_{v.11,p.299} calls attention to the connection between pernicious vomiting and endometritis gravidarum. Coles, of St. Louis,⁸⁹_{p.34} reports a very interesting but obscure case, as to etiology, of paraplegia in a married woman, the paralysis disappearing when she becomes pregnant.

Voituriez, of Lille,²²⁰_{v.13,p.313} reports a case of obstinate vomiting in pregnancy caused by retroflexion of the uterus: restoration of the organ was accomplished and the disorder ceased.

Treatment.—Günther, of Montreux,³¹⁷_{p.465} advises electricity, the

continuous current, the positive pole being applied to the cervix and the negative to the back, between the eighth and twelfth dorsal vertebræ. Each sitting was from seven to ten minutes, and the strength of the current at first was from two and a half to three milliampères, and never increased to more than five. Greene²²_{v.1,p.238} reports a very grave case, which was cured by a few doses of chloride of sodium, five grains (0.32 gramme), in one ounce (thirty grammes) of chloroform-water. Jennings⁶_{v.1,p.364} reports a case in which the vomiting was cured by fifteen grains (one gramme) of antipyrin given at bed-time. Collins and William Duncan report cases in which the application of a 10 per cent. solution of cocaine to the vaginal vault and cervical canal was successful. Rose⁵⁹_{v.2,p.175} commends the use of rectal injections of carbonic acid, as first advised by Schücking.

Clarke⁶¹_{v.10,p.40,117} reports a case in which it was necessary to induce abortion for excessive vomiting. The woman recovered. A. L. Fulton⁷²_{Apr.} reports a fatal case. He had previously desired to induce abortion, but was dissuaded from this wise action by consultants.

INTERMITTENT CONTRACTIONS OF THE UTERUS DURING PREGNANCY.

Braxton Hicks⁶_{v.1,p.65,564} presents the following conclusions: "1. During the whole of pregnancy the uterus contracts at intervals, varying much, but commonly from five to twenty minutes, remaining so for a shorter time—say from three to five minutes. 2. If we place the examining hand at the time of contraction on the uterus, it will be firm, pear-shaped, and the fetal parts not readily, if at all, detectable; if we place our hand on it during the state of rest, or allow it to remain on till the firm state is passing off, then the outline of the uterus is indistinctly felt; sometimes it cannot be felt at all, while the fetus is to be more or less clearly made out, and can often be pressed with the fingers outside into various positions even as early as the fifth month. 3. By noting these facts we are enabled with ease in general to decide as to the existence of normal pregnancy, to diagnose between this and various tumors, both uterine and abnormal, between pregnancy and distended bladder, and other conditions easily called to mind by the practitioner. 4. These intermittent contractions have the physiological use of emptying the loaded uterine veins, changing highly carbonized blood for that more aerated. 5. From observations I

have made I am inclined to think that there is some constant relation between the accumulation of this highly carbonized blood and the fœtal movements, and also between the fœtal movements and the uterine contractions."

HEMORRHAGES IN PREGNANCY.

Varnier ⁶³_{Mar.} states that out of eighteen cases of rupture of varicose vulvar veins, eleven proved fatal. In such hæmorrhage direct compression should be used, or the bleeding vessel secured by serre-fine.

Budin ⁷³_{Jan. 14} considers the subject of internal hæmorrhage of the gravid uterus at some length. He refers to the observations of Blot as to the liability of albuminuric women to suffer hæmorrhage in connection with the third stage of labor, twelve out of forty-one, according to his statistics, being thus affected. Budin also refers to the more recent investigations of Winter, who found that in three albuminuries there was premature detachment of the placenta, no violence having been done which could explain the accident. In addition to changes in the plasticity of the blood, as in albuminuria, Budin gives as causes of this hæmorrhage traumatism, violent efforts in defecation, disease of the placenta, and profound mental impressions which may by reflection to uterine nerves cause abrupt contractions that detach the placenta.

The common practice in grave internal hæmorrhage is to rupture the membrane, deliver as soon as possible, and excite uterine contraction. Budin states, however, that some obstetricians, among them Spiegelberg and Winter, hold an opposite opinion, believing that the membranes should not be ruptured, for thus a new hæmorrhage is invited by the ampler space; that with the excess of tension there is reason to hope for hæmostasis. They urge the unfortunate results of forced delivery, rejecting it absolutely.

DISEASES COMPLICATING PREGNANCY.

Influence of Pregnancy upon Diseases of the Heart.—S. Rémy ¹⁸⁴_{Apr. 1} in an interesting contribution to this subject, gives the following conclusions: The influence of a first pregnancy upon cardiac affections is real, but not necessary, and it is advisable to determine clinically the relative frequency of gravido-cardiac accidents under these circumstances. In cardiopathic multiparæ, the

heart being frequently enfeebled, the pregnancy, especially if complicated by thoracic affections, may serve as the occasion of asystolic accidents, and that in the cases in which serious cardiac disorder have previously occurred one has ground for thinking that these accidents will be reproduced, lasting as long as the pregnancy, and that they may cause death.

Diphtheria.—Korotkevich⁶_{Dec. 10, '87} reports a case of diphtheria occurring in the fifth month of pregnancy. The patient was delivered at term of a weakly boy.

P. O'Connell, of Chicago, ²_{Feb. 4} treated a case in the second month of pregnancy. The child, born at term, was perfectly healthy.

Small-pox.—Sangregorio¹³⁹_{May} made observations on seventy-two cases of small-pox in pregnant women. There were thirty-one miscarriages and twenty-six deaths. Of the seventy-two cases, there were seven of varioloid with one miscarriage; forty of discrete variola with ten miscarriages and three deaths; twenty-two of confluent, with seventeen miscarriages and nine deaths; three of hæmorrhage, with three miscarriages and three deaths.

Measles.—C. L. Morgan, of Wichita, Kansas, ⁷²_{Dec. '87} was called to a case of measles in a woman who was delivered next day of a boy completely covered with the measly rash. The child recovered, but the mother died of double pneumonia. D. V. Wale, of Jasper, Missouri; J. E. W. Charles, Armourdale, Kansas; J. S. Baughman, Argonia, Kansas; M. M. Rhoades, Graham, Missouri; and H. C. Shuttee, West Plains, Missouri, report cases ⁷²_{Dec. '87} of measles occurring in pregnancy, the delivery being at full term and the children healthy. Rhodes also cites a case in which premature delivery took place during the period of desquamation, the fœtus being dead for twenty-four hours and covered with the characteristic rash; while N. S. Bridgemen, of Winfield, Kansas, ⁷²_{Dec. '87} had a case in which abortion occurred on the fifth day of a rather severe attack of measles. W. J. Mathis, of Cotton Plant, Arkansas, ¹⁸⁶_{Feb.} has attended six cases without any abortions or untoward effects, and he believes that in many instances the treatment rather than the disease is to be blamed for accidents. R. H. Hannah, of Flora, Arkansas, ¹⁸⁶_{Apr.} treated a case in which the rash appeared two hours before delivery, the child being also covered with the spots. Both recovered.

Erysipelas.—Kime¹¹⁵_{p.134} narrates some cases of erysipelas in pregnant women. In one the labor was premature, and the child was born having the disease, which affected the same parts as those involved in the mother. If the disease does not occur until near the end of pregnancy, the probability of premature labor is not great.

Ante-partum Peritonitis.—Gow³⁶_{Jan.} narrates a fatal case of peritonitis in a pregnant woman. It was impossible from the autopsy to learn the cause of the disease. He refers to three similar cases which have been reported.

Insanity.—Budin¹⁸⁸_{p.429} condemns bleeding and the induction of abortion, but advises tonics and hydrotherapy; morphia is also sometimes indicated, and in case of cranial hyperthermia blisters and cauteries to the neck and cold to the head.

Chorea.—Barton C. Hirst⁸⁹_{Jan.} reports a case of chorea in a pregnant woman; labor was induced in the ninth month, and fifteen days after delivery the disease had disappeared.

Dr. Clara Marshall reports two cases, one occurring in her own practice and the other in that of Dr. Laura Hulme. Both women recovered after labor.

A. L. Benedict, Rochester, N. Y.,²⁵⁹_{Sept.} treated a case of chorea in a woman five months pregnant, who had had choreic attacks twice before, the first time at the age of fifteen years.

W. N. Sherman, of Kingman, Arizona,¹⁸⁶_{Sept.} and L. G. Walker, of Pound, Wis.,¹⁸⁶_{Aug.} report cases in which the chorea seemed to be directly due to pregnancy.

Anthrax.—Marchand²⁰_{Bd. 19, H. 1} reports the case of a multipara, employed in a factory where horse-hair was cleansed, who became infected with the bacilli of anthrax, probably fourteen days before labor. The patient was delivered in normal labor, but died a few hours afterward in collapse, with subnormal temperature. Post-mortem examination revealed the thoracic duct and abdominal lymphatics filled with anthrax bacilli; the nature of the germs was proved by experiments upon animals.

On the fourth day after the mother's death the child died suddenly. Several hours previous the skin became covered with bluish-red blotches, while the feet and hands were uniformly colored.

Examination of the child's body demonstrated a thoroughly

disseminated infection by anthrax, which had caused multiple hæmorrhage in the parenchyma of the principal organs. In the placenta the bacilli were found in the intervillous spaces only, on the superficial portion of the villi.

Marchand believes that during the separation of the placenta the germs obtained access to the fœtal blood through rupture of the villi of the chorion.

The case is regarded as an example of the direct passage of disease germs from the maternal to the fœtal blood.

Typhoid Fever.—At a meeting of the Obstetrical Society of Hamburg, Schütz³¹⁷_{May 19} presented two fœtuses for inspection, born by abortion at six months on the fourteenth and twenty-fourth day of typhoid fever; the mother of the fœtus born in the second week of the fever died three days afterward; the other mother recovered. Both children presented no signs of maceration, and seemed to have died during birth. One had been in face presentation *in utero*.

Lomer, in discussing the cases, believed that abortion occurred less frequently in typhoid fever than was commonly supposed; he cited a case, four months pregnant, in which the mother's temperature was persistently above 104° F. (40° C.) for some time; recovery ensued, the woman went on to term, and was delivered of a healthy child.

Fränkel thought that a normal placenta did not permit the passage of typhoid bacilli from mother to fœtus. He had inoculated pregnant guinea-pigs with typhoid bacilli, and when the placenta had remained intact the young were not affected. When hæmorrhage in various portions of the placenta was found, the young had become infected. Those who had reported cases of fœtal infection of typhoid had not reported the condition of the placenta.

Nephritis.—Cohn³¹⁷_{Dec. 10} concludes from the study of fifteen pregnant women suffering from nephritis that nephritis in the mother exercises a potent and unfavorable influence upon the fœtus. Of the fifteen children but two were born living and viable; eight were macerated. But two of the placenta were normal; one was very œdematous.

Cohn estimates fœtal mortality from nephritis in the mother to be 87 per cent. The cause of this mortality is placental endar-

teritis, with necrosis of the connective tissue of the placenta, resulting in diminishing the surface available for the aeration of the maternal and fetal blood. Labor should be induced early in these cases, disregarding the child's life.

Albuminuria.—Varnier,⁶³_{p.194} in a paper upon "Albuminuria and Eclampsia," incidentally considers the frequency of the former in pregnant women. He gives the statement of Dumas that one in six or seven pregnant women is albuminuric, and then adds that of eight hundred pregnant women in good health, who were under the care of Pinard, and whose urine was systematically examined every fifteen days in the last three months of pregnancy, three only had gravidic albuminuria, and all of these were primigravidae.

Peptone in the Urine during Pregnancy a Sign of Fœtal Death.—Koettwitz,⁶⁹_{July 26} has made a critical study of the urine of pregnant women, and has demonstrated the value of the presence of peptone as a clinical sign of the death of the fœtus. Von Jaksch,¹¹⁸⁵_{p.215, '87} has shown that peptone is formed by processes in the body which decompose the serum-albumen of the cellular elements; such processes are septicæmia, sarcoma, tuberculosis in advanced stages, and severe scorbutus. When, therefore, the fœtus has been dead *in utero* sufficiently long for the decomposition of its cellular elements to have taken place, peptone is found in the mother's urine. Peptone is not found in eclampsia and nephritis, nor when the fœtus dies during labor. Koettwitz reports in detail two interesting cases of the premature birth of macerated children, in which diagnosis of fœtal death was made from the presence of peptone in the mother's urine.

[Urine may be tested for the peptone as follows: When heat and nitric acid and acetic acid and potassium ferrocyanide give no reactions for albumen, potassium hydrate in solution should be added to the urine to obtain an alkaline reaction; a dilute solution of cupric sulphate should then be added drop by drop, by a pipette. A greenish precipitate forms, which gradually changes to a reddish violet if peptone be present. This test is often called the biuret reaction.]

Ovarian Tumors.—Terrillon²³⁶_{p.297} reports three cases of pregnant women suffering from ovarian tumors, in all of whom he performed ovariectomy. All recovered, and in two the pregnancy was

not interrupted. He presents the following conclusions: 1. The coincidence of an ovarian cyst with pregnancy most frequently exposes the patient to grave accidents. 2. In these complicated cases ovariectomy is preferable to puncture. 3. The removal of the cyst gives better results if the operation is done in the third, fourth, or fifth month of pregnancy. Unless urgently required, ovariectomy ought not to be done, but the operation postponed until after delivery. 4. In the course of the operation the uterus should be touched as little as possible. A few cases seem to show that if the uterus be wounded in the operation, it is better to evacuate it and employ sutures. 5. The precautions taken differ but little from those used in an ordinary ovariectomy.

Hanks, in a paper upon "Pregnancy Complicated by Tumors," ²⁷_{Mar.} presents the following conclusions: "In cedematous tumors, use hot-water douches, press upon the tumor, or, if necessary, later, incise it. In fibroid tumors, bring on early abortion if nearly all the cervix is involved; when subperitoneal or interstitial, near either lip, or the os internum, press the tumor up above the brim, if possible, otherwise place the woman in the knee-chest position and enucleate; if unable to deliver through the natural passage, perform the Cæsarean section or Porro's operation. In cancer induce abortion if the cancer is decidedly hard and involves all the cervix; if child seems to be failing, induce labor at once; remove local disease with best means at command. If spontaneous delivery does not occur, use forceps first, turning second, and Cæsarean section third."

Lithopädion.—Oppel ³⁴_{Nov. 1, 2, 3} reports a case of lithokelyphopädion, or lithopädion, with chalky formation in the capsule of the fœtus. The patient was pregnant for the second time, and exhibited the usual signs of her condition until the seventh month, when fœtal movements and heart-sounds ceased and the abdominal tumor hardened. At term pains and the discharge of decidua occurred, after which the patient recovered, and suffered very little inconvenience from the tumor, which was as large as a man's head. It subsequently increased slightly in size, and occasioned pain and distress through pressure on the rectum and bladder.

Eleven years after pregnancy had occurred the patient died from fatty degeneration of the heart and pulmonary œdema. Menstruation had been regular, and conception did not take place

again. Post-mortem examination revealed the tumor at the brim of the pelvis, adherent to the left uterine corner; the uterus was slightly enlarged. The fœtus and appendages were intact and inclosed in a chalky capsule, which was adherent to the intestines. The fœtus corresponded to a nine months' fœtus in size, and showed in the superficial connective tissue a chalky formation. The brain was hardened and stained grayish yellow; the meninges were pigmented in blotches.

Oppel tabulates fourteen cases of lithopädion. The length of time during which the tumors were carried varied from seven to fifty-seven years; the weight of the tumors ranged from two to eight pounds. The peculiar tendency to the formation of chalky material found in these cases gives them the name lithokelyphopädion, in distinction from lithopädion. This process may be divided into three stages: first, mummification, with beginning chalky deposit; second, increase in this material with gain in the weight of the tumor, this growth reaching its acme in the third and fourth decade of pregnancy; the last stage was characterized by diminution in weight, probably at the expense of the organic material of the tumor.

Förster's experiments upon animals indicate that the cause of the formation of a lithopädion is the rotation of the sack inclosing an extrauterine embryo. When this accident happens at term decomposition results and septic infection; if the rotation occurs earlier in pregnancy no disturbance is caused. The muscles of an animal lithopädion show a preponderance of the potassium over the sodium salts, a reversal of the usual relation.

Hammel³¹⁷_{Sept. 8} reports an extrauterine pregnancy with the formation of a lithopädion, followed by ulceration and abdominal fistula. Laparotomy was performed and fœtus and sac removed. The pregnancy had been tubal and a lithopädion had formed. The patient died from pulmonary infiltration and nephritis.

Vesicular Mole.—This is considered by Rosenthal⁶¹_{Mar. 3} as one of the varieties of uterine mole. Dubois²²⁰ reports a case in which the woman perished of septicæmia a few days after the removal of the mass, and Blake⁹⁹ a case which recovered. Another case of vesicular mole having the same successful termination is given by Murphy.⁶¹_{v. 10, p. 469}

Thomas More-Madden,²⁶_{July} referring to the mode of treatment,

remarks: "It has been recommended that we should bring on the expulsion of the so-called vesicular moles as soon as they are discovered. This, however, is clearly wrong practice, for it is quite possible that only a portion of the placenta is affected; or, as I have seen, the birth of a healthy living child may be immediately followed by the myxomatous placenta of a blighted twin conception. Hence, if the disease could be diagnosed at any time during the period of pregnancy, we should still let nature take her course rather than by unnecessary interference run the risk of destroying a living fœtus, which experience has shown may possibly co-exist with the vesicular growth *in utero*."

Dr. Madden's practice is correct in general, but expectation may be carried too far, so that when hæmorrhage of a serious character occurs there must be no delay in emptying the uterus and insuring its thorough retraction as the woman's only salvation. James P. Marsh,^{v.48,p.93} publishes a very interesting example of this disease, showing the importance of active treatment. With the hand and with Thomas' dull curette he completely removed the diseased mass. The patient recovered. In regard to the treatment he says: "I wish to particularly emphasize the fact that the hæmorrhage was very sharp from the time of dilatation until I had thoroughly broken up the hydatid mass, and, furthermore, that the hand acts as an admirable tampon to the cervix while the fingers are engaged in the uterine cavity. Hence, I am led to urge that for the removal of large masses of hydatids from the uterus there is no means so applicable as the hand and fingers; but when, however, the mass has been broken up and hæmorrhage in a measure is controlled, I would insist upon the utility of Thomas' curette. Nevertheless, I think the use of this instrument fraught with great danger to the uterine walls. Indeed, so great is the liability of their perforation that the operation should not be undertaken by one who has not an extended acquaintance with this instrument and its application in ordinary obstetric and gynæcological cases."

Polyhydramnios and Abnormal Insertion of the Placenta.—(Arbitrarily hydramnion and hydramnios, the former by German and by English writers, and the latter by the French, are employed to signify excess of the amnial fluid; but neither word can, according to its etymology, mean anything else than amnial fluid, and

therefore they ought to be replaced by polyhydramnios or polyhydramnion, either of which plainly expresses the desired condition of excess of fluid in the amnion.)

Mantel,²³⁶_{p. 46} from the study of many cases, concludes that there is a frequent and undeniable connection between the insertion of the placenta in the inferior part of the uterus and the presence of a large quantity of fluid in the ovum. He believes that when the placenta has such insertion the modifications of circulation in the umbilical cord determine, by an obstacle to the natural course of the blood, a blood stasis, and a more considerable exosmosis into the cavity of the amnion results. Hydramnios and hydrorrhœa are considered very fully by Napier,²_{May 19} but no new explanation is offered of either.

Brouardel states that when he was an interne of a hospital, a woman was admitted who was supposed to have an ovarian cyst, when really she was pregnant, but there was dropsy of the amnion; a puncture was made, free evacuation of the amniot fluid, and pregnancy then discovered. The woman was not delivered until three months after.

Spinal Irritation.—An interesting paper,⁴³_{Mar.} by J. L. Napier, of Blenheim, S. C., contains an account of three cases of pregnancy complicated by spinal irritation, which had been prevalent in his section in an epidemic form some time previously, and following closely a severe epidemic of diphtheria. Dr. Napier believes the former disease to be dependent in a measure upon the diphtheria-poisoned atmosphere. No influence appeared to be produced on the viability of the infants.

Maternal Impressions.—Morton,²²_{v. 1, p. 578} narrates several cases of infantile convulsions, the mother having received a more or less serious shock in pregnancy.

Lowman and Greenly¹³⁹_{Sept.} adduce several instances which seem to show that impressions made upon the mind of the pregnant woman may affect the fœtus. The former of these writers states that he was sceptical as to such influence until facts compelled him to admit the occurrence.

W. T. Evans²³³_{Feb.} takes the opposite view, and presents a strong theoretical argument. We merely add that he who determines to believe only that which can be explained and established upon scientific grounds will have a very short creed.

INDUCTION OF PREMATURE LABOR.

In a recent lecture. Polk, of New York, ¹_{Sept. 15} mentioned, among causes that may require the induction of premature labor, chronic emphysema or bronchitis, liability to repeated attacks of asthma, puerperal mania, chorea, cardiac disease with great mitral stenosis, pneumonia, catarrhal bronchitis, or a pericarditis with a very large effusion; he also states that "physical exhaustion incident to the mental state of the patient is not an uncommon indication for the induction of premature labor." The last statement does not seem to us correct, and may give a dangerous latitude to the operation. Next he presents the subject of pelvic narrowing as an indication, and gives the usual rules as to the time of ending the pregnancy according to the degree of pelvic contraction. Albuminuria and placenta prævia are the remaining indications presented. The method he advises is the use of Barnes' dilators, only using a bougie or rupturing the membrane when the dilatation accomplished by these fails to be followed by uterine contractions.

Strauch ⁹⁵ reports twenty-eight cases from the Moscow Maternity in which premature labor was induced. Pelvic narrowing was the indication in twenty-one cases: the smallest of the pelves was rachitic, and the true conjugate was only 4.7, while in the widest, a simple flat pelvis, this diameter was nine centimetres. Bright's disease furnished the indication in three cases, and habitual death of the fœtus in four. The means tried were the faradic current, kolpeuryesis by Braun's method, Massman's pilocarpine injection, puncture of the membranes, Kiwisch's douche, and the introduction and retention in the uterus of a bougie, or Krause's method. Some of these methods were useless or injurious, and he gives a decided preference to the last. The maternal mortality was 0, and the fœtal 55 per cent. On the other hand, he presents the results of the Cæsarean section—the maternal mortality 11.8 per cent., and the fœtal 8 per cent. His conclusions are the following: 1. With the strictest antiseptic precautions the Krause's method gives good and rapid result if the irritability of the uterus has not already been lessened by Kiwisch's douche. 2. In consideration of the great fœtal mortality in induced labor, the conservative Cæsarean operation ought to be more frequently employed. Vanhoutte ²²⁰_{p. 107} induced premature labor in a case of justo-minor pelvis. Introduction of a rubber sound into the uterus was tried

but could not be accomplished, then the douche was vainly tried, and finally digital dilatation was employed, followed by rupture of the membranes; a dead child was delivered with the forceps. The reason alleged for the failure to introduce the sound was the extreme anteversion of the neck.

The dilator of Charpentier^{55 June} was successfully employed for the induction of premature labor in three cases. This dilator is made of fine silk lined with a thin layer of caoutchouc. The object of the silk is to secure for the instrument a uniform shape. Folded and empty, its circumference is not more than three centimetres; when it is filled the upper part is a cylinder four centimetres in height, and the lower part is a cone of five to six centimetres in length, and ends in a tube through which the dilator is filled; the circumference is twenty-four centimetres, and the cubic capacity three hundred and sixty centimetres. Every time the instrument is used it is carefully washed, and it is placed in a 5 per cent. carbolic acid solution for at least half an hour before its introduction.

In an elaborate paper by Lemièr^{220 Oct. 5} upon the induction of premature labor, the author gives a very interesting sketch of the history of the operation, and attributes to Justine Siegenmundin, a famous German midwife, the first employment of this method in the treatment of placenta prævia. As indications for the treatment are diseases of the mother which are aggravated by pregnancy, enormous distention of the abdomen causing dyspnœa, extreme pernicious anæmia, uncontrollable vomiting, hæmorrhages repeated from placenta prævia, convulsions, chorea, nephritis with excessive œdema, organic affections of the heart and of the respiratory organs. But he wisely adds that the accoucheur should carefully discriminate between that which depends upon pregnancy and that which does not, and that in some women already seriously ill the puerperal state places them in danger of immediate death, and it is better not to intervene unless compelled to by the danger of the child. The second indication is prolonged pregnancy—this occurrence being very rare—and the third, habitual death of the fœtus. Pelvic narrowing is the final indication considered. The writer remarks that the biparietal diameter is ten centimetres at term, increasing during the last three months one centimetre a month, and as this diameter can be reduced without injury to the child

one centimetre, it is evident that the foetus at seven months can pass through a pelvic diameter of seven centimetres; hence, too, if the true conjugate be eight centimetres, premature labor should be induced at eight months.

Lemière next discusses the question as to podalic version in difficult deliveries before term in preference to the forceps, stating that in moderate pelvic narrowing a cranial presentation is not to be feared and turning is not indicated; but if the narrowing be extreme, if delivery cannot be ended spontaneously, as an application of the forceps would be impossible, version difficult after the escape of the waters, in such cases it seems proper, before the induction of labor, to perform version. The author rejects all other means for causing labor as inferior to Krause's.

Charles²⁵⁶_{Oct.} is in favor of the induction of labor in albuminuria resisting treatment, and with threatened convulsions.

T. R. Pooley¹_{Mar. 24} and J. L. Thompson⁵⁹_{V. 33, p. 239} advocate the induction of premature labor in case of albuminuric retinitis.

Kraskovsky¹⁴_{May} reports a case of albuminuria in a woman in the ninth month of pregnancy, in which he induced premature labor. At the beginning of this month she suddenly lost her vision. Detachment of the retina was found in each eye; the urine contained albumen, very many hyaline and granular casts, and renal epithelium. She was delivered of a macerated foetus, premature labor having been induced, and a week after her delivery was able to distinguish the smallest objects, her vision being perfectly restored.

MISCELLANEOUS.

Sextuple Pregnancy.—Several medical journals contain references to a case of sextuple birth, occurring in Castagnola, Switzerland. The mother was thirty-six years old, and was delivered on the 6th of last May of four boys and two girls. The united weight of these six children was only three pounds and thirteen ounces, and the length of their bodies, which were perfectly well-formed, varied from eight and three-quarters to ten and a quarter inches. This is generally regarded as the only instance, well-authenticated, in which a woman has given birth to more than five children at one time.

Protracted Gestation.—John G. Blake⁹⁹_{Feb. 16} discusses this subject,

and adduces several cases that have been regarded as evidences of the prolongation of pregnancy very much beyond the usual time, but the author abstains from a positive conclusion.

OBSTETRICS AND PUERPERAL DISEASES.

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ANTISEPTICS.

THE careful reader of the medical journals, published during the past year, must be convinced of the truth of the statement made by W. Balls-Headley,^{285 July 15} in an admirable address read before the Victoria Medical Society, that the extension of the principles of antiseptics to hospital midwifery has almost removed the mortality and changed the record of morbidity. This paper is based on a critical personal inspection of the lying-in hospitals and outdoor midwifery departments in Europe and America, and in every one of them he found that the management was conducted on this system.

The results of the introduction of this method of procedure have been most remarkable, and the statistics recently reported show even a marked improvement over those heretofore printed. Leopold reports^{69 No. 29} that out of three thousand one hundred and ninety-six women who were confined in the Dresden Hospital (May 1, 1884, to September 1, 1886) only four (.12 per cent.) died of septic infection. Dr. Inoeffs^{6 July 24} reports that at the Moscow Lying-in Hospital there have been seven hundred and fifty-six labors without a single death due to infection. There were three deaths, one due to rupture of the uterus, one to eclampsia, and one to tuberculosis. Fischl states^{317 No. 22, 23} that the death-rate from sepsis in the lying-in hospitals of Austria, Germany, Russia, and Bohemia has fallen 50 per cent. From 1874 to 1884 the rate was 1.3 per cent., while since 1884 it has fallen to .42 per cent. He adds that in private practice on the Continent the death-rate is much higher, owing to the fact that the normal cases are, as a rule, conducted by midwives, and, consequently, the antiseptic principles are not so rigidly carried out.

I have just finished writing the annual report to the Trustees of the Boston Lying-in Hospital, from which it will appear that
(I-1)

during the year ending December 31, 1888, four hundred and sixty-six women have been confined in that hospital, with one death (.22 per cent.) from septicaemia, and that was a patient seven months pregnant, who was brought into the hospital in labor, having, as it was afterward learned, been operated upon by an irregular practitioner. In the General Lying-in Hospital (London) during the last three years but one death has occurred from infection.

The only opposition met by the advocates of antiseptics in obstetric practice comes from a few writers who claim that, while there may be a need for such precautions in hospital practice, septicaemia is rarely met with outside of hospital wards. In the introductory address delivered by Charles J. Cullingworth at St. Thomas' Hospital, October 1, ²_{Oct. 6}, a strong plea is made for the more general adoption of antiseptics in midwifery practice. As proof of the need of such a change the writer quotes the figures of the Registrar-General's Report, by which it appears that within three years (1884-86) six thousand nine hundred and sixty-six deaths were reported as due to puerperal fever, or an average of two thousand three hundred and twenty-two cases per annum, in England and Wales. Of course, these figures are far below the actual truth, and there can be no question but that many deaths assigned by physicians to other causes should properly be added to these figures. In Germany the use of antiseptics in private midwifery practice is now a matter of State regulation. In this country it must depend on each individual practitioner, but there can be no doubt, as Cullingworth says, "that puerperal fever, both in its fatal and non-fatal manifestations, may be practically stamped out." In the face of the evidence contained in the leading medical journals of America and Europe, the practitioner who fails to adopt antiseptic precautions in his private practice must certainly be held responsible for the mortality and morbidity which occur among his obstetric cases. There can be no question but that the authorities in obstetrics the world over believe that the infection comes from without, and that puerperal septicaemia is never autogenetic.

In a paper read before the Midland Medical Society G. H. Joy ³²_{June} still believes that many cases are purely autogenetic, having a "spontaneous origin from some condition of the patient's blood or nervous system." As proof of this statement he curiously

quotes an extract from a monograph of mine, the whole tenor of which monograph was to prove just the reverse.

A. Döderlein, of Leipzig, ⁹⁵_{1891, 1892, 93} gives the details of researches in regard to the appearances of germs in the lochia. Under normal conditions the lochia from the uterus contains no fungi, while that from the vagina contains numerous germs of different kinds. The lochia from the uterus can, under normal conditions, be injected into animals without producing any reaction, while that from the vagina may produce abscesses. The existence of germs of any kind in the puerperal uterus will, as a rule, cause an elevation of temperature. After the temperature has fallen it will be found that the lochia from the uterus is again free from germs. The removal of these germs from the uterus is always followed by an increased purulent secretion. Before the rise in the temperature germs may be found in the uterus. There is, therefore, a certain period of incubation, and it may even require some special cause to render the germs harmful. The lochia from the uterus of fever patients will produce appearances of infection in animals. Only in those cases where there are so few germs that the febrile disturbance is slight will the lochia produce no effect in animals.

Writers are still divided in opinion as to the best method of using antiseptics, and much has been written as to what antiseptic should be used. While many authorities are willing to admit the superiority of corrosive sublimate as a germicide, not a few, however, hesitate to recommend its adoption in general practice, owing to the danger of mercurial poisoning. Nor is this danger, they claim, limited to its use within the uterine cavity. Maurer has reported cases of serious poisoning and even death following a single vaginal douche. That mercurial poisoning may follow the use of corrosive sublimate injections improperly given there can be no doubt, but, after a long experience with their use in the Boston Lying-in Hospital, I am persuaded that the injurious effects reported are either the results of ignorance or carelessness in regard to their proper use, or because they were used in improper cases.

Emile Blanc ²¹¹_{Aug. 12, 19} critically considers the dangers of using corrosive sublimate, but does not believe in giving up its use. In cases of anæmia, renal disease, or after a serious post-partum hæmorrhage it should give way to carbolic acid. Whenever an intrauterine injection is given great care must be exercised to

provide for a free return flow. Dr. Blanc advises that the corrosive sublimate injection be used as strong as 1-2000, but followed by an injection of carbolic acid solution of from 2 to 3 per cent. This does not seem to be necessary, so far as vaginal injections are concerned, if care is taken to press back the perineum so as to prevent the retention of a portion of the fluid within the vaginal canal. As regards the use of intrauterine injections of corrosive sublimate, there is no question but that they should always be followed by one of carbolic acid.

L. Roulin¹⁷_{Sept. 27} advises that the external genitals be washed before and after labor with a solution (1-100) of hydrate of chloral. The labor being concluded, he applies over the vulva a double salol gauze pad, and over this is placed cotton which has been soaked in chloral (1-100). This dressing should be changed every six hours.

Max Kortüm³¹⁷_{Feb. 31} highly recommends the use of creolin ($\frac{1}{2}$ to 2 per cent. solution), inasmuch as its strong odor would be a guide to its effectual use and its innocuousness renders it preferable to corrosive sublimate. Its very odor would seem to be objectionable, inasmuch as it would prevent the offensive character of the lochia in a doubtful case from being readily detected.

Charles P. Noble¹⁹_{Mar. 31} advises that whenever the hand or an instrument has been introduced within the uterine cavity or a macerated fetus has been delivered iodoform be introduced in the form of a pencil, after the cavity has been washed out with the sublimate injection. At the Philadelphia Lying-in Charity the formula is

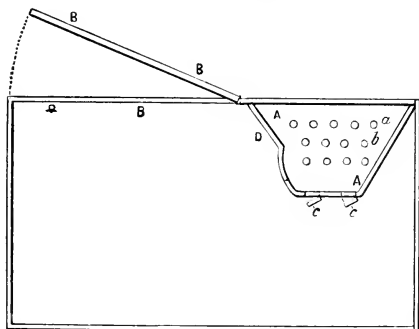
R Iodoformi,	. . . . .	3 5 (147.8 grammes).
Acacie,		
Amyli,		
Glycerini,	. . . . .	aa 3 $\frac{1}{2}$ (2 grammes).
M. ft. bacilli no. iii.		

J. A. Kaschkaroff⁴⁸_{Mar.} has devised an apparatus by means of which it will be possible to keep during the delivery the lower part of the body and the generative tract constantly under the surface of sterilized water. As will be seen from the diagram, the apparatus consists of a porcelain bath, with a back-piece supporting the patient's spine (B B), set into a table similar to those used for gynecological purposes. On the sides and foot of the bath are numerous small openings (a b c), each having a valve. A certain

number of these openings are for the inflow and others for the outflow pipes. To one of the outflow pipes a suction-pump is attached. The water is first sterilized and then passed into a reservoir, from which, at any required temperature, it is carried to the bath. The value of such an apparatus is chiefly in cases where the fœtus is known to be putrid or macerated, or when it is proposed to perform craniotomy on a dead child.

ANÆSTHETICS IN LABOR.

In an article on the use of chloroform in obstetric practice, Budin¹⁴_{Sept. 5} quotes the results which have been obtained by Campbell as to the effects of anæsthetics. Sensibility disappears first, then intelligence, and finally the ability to move. In analyzing the



OBSTETRICAL OPERATIONS UNDER STERILIZED WATER. (*Annales de Gynécologie.*)

suppression of sensibility it is found that sensibility to pain goes first, then the sensibility to temperature, and finally to contact. Reasoning from these results, Budin advises the use of chloroform in obstetrics, but only to an extent which will dull the pain, but not produce anæsthesia, unless, indeed, it be necessary to perform an operation. For the simple application of forceps it is only necessary to give a very slight amount of chloroform.

Swięcki, of Posen,³¹⁷_{Oct. 27} has used with very satisfactory results a mixture of four parts nitrous oxide and one part oxygen. By allowing the patient to take a few deep breaths, the contractions of the uterus are rendered much less painful, while at the same time the progress of the labor is not interfered with. Winckel

considers the mixture perfectly harmless and one that can be freely used during labor. It is of especial value in primiparae somewhat advanced in years. Zweifel and Krentzmann also speak favorably of it as a safe anæsthetic.

The value of antipyrin as an agent for the relief of labor pains is still *sub judice*. Netter²_{Jan. 28} considers that it unquestionably diminishes the severity of the pains, while at the same time the uterine contractions are rendered more effective. Laget and Chouppe⁴²⁶_{Dec. 30, '87} also claim that great relief may be obtained during labor by its use. In several cases I have seen relief follow the use of fifteen grains (1 gramme) repeated hourly until three doses have been given, in cases in which the first stage of labor was prolonged by an undue rigidity of the os uteri. In some cases, however, no apparent results followed its use. The results obtained in the Boston Lying-in Hospital have not as yet been such as to warrant any definite conclusion as to its value.

Sielski³¹⁷_{v. 32, p. 247} has seen the happiest results follow the use of fifteen grains of antipyrin repeated, if necessary, at hour intervals, and Rivière⁷⁰_{July 22} obtained most satisfactory results. At the beginning of labor he gave fifteen grains, and the dose was repeated in an hour if necessary. In the majority of cases one dose was found to be sufficient, but in two cases it was found necessary to give six doses before relief was obtained. The best results were obtained in cases in which the uterus seemed to be almost in a state of tetanic contraction accompanied by intense pain. Queirel, of Marseilles,³_{Mar. 14} recommends its use, especially during the first stage of labor. He thinks that the greatest relief is obtained by the use of subcutaneous injections of from four to eight grains. Auvard⁶⁷_{Oct. 15} however, considers that in the great majority of cases no relief follows the use of antipyrin, and that in those cases in which good results have been obtained they are due to the mental effect on the patient.

Auvard and Secheyron²³⁶_{No. 1, 2, 3; June 5} give, as a result of an analysis of thirteen cases in which a parturient was hypnotized, the following conclusions: As an anæsthetic hypnotism is uncertain and inefficient. It does not favor the progress of the labor, but, on the contrary, it produces a decided diminution in the force of the uterine contractions. During the first stage of labor hypnotism can be induced in women of a decidedly impressionable character,

but it fails during the expulsive stage. In this class of women a preparation containing only the least trace of chloroform will be found to work about as effectively as any attempt at hypnotism, its effect being unquestionably due to mental impression.

J. Hardcastle¹⁹_{Apr.7} has seen the best results follow the administration of one-third of a drachm (1.34 grammes) of fluid extract of jaborandi, given every half hour until diaphoresis occurs. The os dilates more rapidly and the severity of the pains is greatly relieved.

FUNIS.

Proper Time for Tying the Cord.—A. Jacobi⁵¹_{Mar.} insists that there should be no absolute rule as to the time for tying the umbilical cord. If the pulsations in the cord be allowed to cease, the placenta being compressed as recommended by Credé, the child will gain three ounces of blood which would be lost by early ligation. In cases where the baby appears pale and poorly nourished the gain of this additional blood would be very desirable. On the other hand, it must be borne in mind that the blood-vessels of the newly-born baby are very delicate, and that spontaneous hæmorrhages on serous membranes and around nerve-centres are by no means rare, and therefore in many cases this additional blood supply may, from the appearance of the baby, be clearly contra-indicated. It may even be desirable to allow some blood to escape from the cut funis before applying a ligature. Wherever the cord is thick, a second ligature should be applied subsequently between the first and the abdomen to prevent the secondary hæmorrhage which is liable to occur from the arteries which are insufficiently compressed after the cord begins to shrink.

In dressing the cord, it should be remembered that warmth and dryness are desirable. All moisture and fatty substances should be avoided. The best applications are powdered subnitrate of bismuth, oxide of zinc, iodoform, or salicylic acid—one part of either of these with ten parts of powdered starch. This application should be made daily. The use of carbolic acid or preparations of iron in those cases where, for any reason, cicatrization is delayed and there is a purulent or serous discharge is positively injurious. Any of the above-named powders are preferable.

W. Thornton Parker²⁶_{Mar.1} makes a strong protest against any delay in tying the cord. Where it has been tied late good arterial

blood is lost at the expense of poor venous blood. By early tying the baby starts with the best supply of blood possible. He considers the boric acid ointment the best dressing which can be used after the cord has been ligated and cut.

Short Cord a Cause of Dystocia.—E. B. Shaw, of Osage City, Kansas,⁷²_{May} believes that a short or coiled cord is a much more frequent cause of dystocia than is generally recognized. He considers that the unaccountable delay toward the close of the second stage is in many cases due to this condition of the funis. In studying up the literature of the subject and examining the details of reported cases he has found that some of the following symptoms have been observed in every recorded case of coiled or short cord:—

1. Sudden slowing of the fetal heart when pressure was made during auscultation, with a return to the normal frequency after six or seven beats when the pressure was removed.
2. A peculiar and constant pain over the abdomen.
3. Delay.
4. Recession of the head during absence of pain.
5. Hæmorrhage from laceration of the cord or separation of the placenta.
6. A cup-like depression of the fundus during a pain.
7. Peculiarity of the uterine contractions—becoming short and inefficient.
8. An instinctive desire to assume the upright position.
9. A tense cord.

The diagnosis of this condition can, of course, only be made out by a grouping of the symptoms in any given case and by exclusion. The slowing of the fetal pulse under pressure has been insisted upon by Schatz as almost a sure indication of this condition of the funis.

In this connection Dr. Shaw alludes to the great value to be derived in such cases from following the advice given by Dr. King to have the patient assume the erect, sitting, squatting, or kneeling position. This change of posture allows the womb to settle lower in the pelvis, and an immediate advance of the presenting part will follow.

Turgard,⁴⁸_{May} as the result of a study of cases which he reports, believes that when, in posterior position of the head, the occiput has been artificially rotated forward and later has shown a tendency to return to its former position, one may suspect that the funis is coiled around the neck. In such cases the fetal heart should be carefully watched, and delivery should be at once accomplished

if there be evidence of interference in the fœtal circulation. He also suggests that such loops of the funis about the neck may even be one of the causes of posterior positions of the occiput.

In applying forceps I have frequently found the cord firmly about the neck in those cases in which the head had a marked tendency to recede in the interval between the attempts to apply traction.

Prolapse of the Cord Before Labor.—Two cases in which the cord was prolapsed during the latter months of pregnancy are reported ²²_{Dec. 21, '87} as occurring at the Hôpital de la Pitié, under the care of Ch. Maygrier. In neither case had labor begun. Still-born children were the result in both cases.

ECBOLICS.

Ergot.—J. W. Hyde ¹⁵⁷_{Feb.} contributes a most valuable paper on the uses and dangers of ergot in obstetric practice. In it he clearly shows how ergot, administered before delivery, produces a frightful mortality among infants; is liable to produce rupture of the uterus, as well as of the soft parts of the generative tract; is the most frequent cause of retained placenta, subinvolution, and even uterine displacements. He adds the statement that its use has now been condemned and abandoned by many of the largest maternities in Europe and America. G. J. Engelmann and Charles Jewett add their protest against the dangerous practice of giving ergot before the labor is completed. Walter Lindley, ⁴⁴_{May} of Los Angeles, Cal., agrees that such a use of ergot unquestionably delays the progress of involution.

De Saint-Moulin ²⁵⁶_{Jan. 30} reports three cases which have come under his own observation, which have convinced him of the necessity of urging that ergot should never be used while there is anything in the uterus, whether it be a child, placenta, or clots. When the uterus is empty it may be given, if there is any indication for its use.

Von Swięicki ¹¹⁶_{Apr.} has observed excellent results follow the administration of the fluid extract of *ustilago maidis*. He has given twenty-five drops, repeating the drug in fifteen-drop doses at fifteen minutes' interval. One dose was often sufficient, and never more than three were required to increase the force of the uterine contractions.

Verrier⁴⁸_{Feb.} has found that the ergot of oats possesses an action similar to that of the ergot of rye, as regards the effect on the contractility of the uterus. Its general action is exciting, being similar to what would follow the taking of a moderate quantity of alcohol.

John Phillips²_{Oct.13} has made a careful study of the value of pilocarpine in obstetric practice. He finds that it is not reliable as an ecboles. During the first and second stages of labor it increased and intensified the labor pains to a much greater degree and in a safer way than ergot did. The best results were obtained in cases of uterine inertia; after delivery it was absolutely of no value. In cases of puerperal eclampsia, while good results were observed in twenty-eight cases, the most dangerous symptoms were observed in nine.

E. H. Grandin¹⁰⁵_{Sept.1} strongly urges the use of the faradic current during the first stage of labor when the pains are irregular, weak, and ineffective. One pole should be placed in the patient's hand while the physician holds the other, and the circuit is completed by massage with the other hand over the uterus. By this use of electricity the character of the pains is altered and the progress of the labor is greatly accelerated. In threatened post-partum hæmorrhage or rigidity of the os uteri great benefit follows the use of electricity.

MECHANISM OF LABOR.

Dr. Boxall⁶_{Jan.25} calls attention to the fact that late rupture of the membranes diminishes the resistance offered by the soft parts to the passage of the head as it begins to descend, and thus flexion in the early stages, which is very desirable, is lost. On this same principle is explained the fact that women with large pelves or small children do not necessarily have easy labors, inasmuch as the head, failing to flex from lack of normal resistance, is extended and becomes jammed at the lower pelvic straight against the ischial spines.

As regards the delivery of the shoulders, R. Lefour¹⁸⁸_{Aug.12} believes that, as a rule, the posterior shoulder is born first. In this connection it may be said that Auvard found in twenty-nine cases that the posterior shoulder came first in sixteen cases and the anterior shoulder in nine. Lefour strongly recommends that in all cases after the head is born it should be well supported in order to prevent its own weight from interfering with the natural progress

of the expulsion of the body. Before attempting to extract the body the shoulders should have completely rotated, and if possible the body should be expelled by the *vis à tergo*. He urges particularly the importance of so assisting the expulsion of the body as to carry the anterior shoulder well up behind the symphysis pubis. By so doing we facilitate the delivery of the posterior arm, which is the safest and most natural method of delivery. In cases in which one has to deal with the after-coming head, the same method of procedure should be followed. It will be readily seen that by following out these suggestions the "cervico-acromial" diameter is substituted for the "bi-acromial," which is much longer.

THIRD STAGE OF LABOR.

A. H. Freeland Barbour²⁶_{Aug.} contributes a careful criticism of recent papers by Cohn, Champneys, and Berry Hart on the third stage of labor, in which he still adheres to the views to which I referred in the last ANNUAL. He regards the third stage as a second labor in miniature. After the expulsion of the child there is a pause, during which the placenta is still as a whole or in great part attached; then labor begins again, and the placenta is first detached and then expelled. Occasionally no distinct interval separates the second from the third stage of labor. Professor Simpson and Dr. Milne Murray agree²⁶_{Apr.} with these views.

Lusk²⁷_{Aug.} advises that the placenta be forced out during a uterine contraction, but that the physician wait until the uterus relaxes before attempting to draw out the membranes in cases where they have not been expelled simultaneously with the placenta.

The discussion between the advocates of the expectant method of delivering the placenta and the followers of Credé still continues, but the former seems to have the best of the argument, and many of the best practitioners are lengthening the time between the expulsion of the child and that of the placenta.

Ahlfeld⁵¹_{May 15} states that careful investigations have convinced him that Credé's method has various disadvantages, and, above all, that it favors the occurrence of post-partum hæmorrhage. The expectant plan gives far better results. Out of eight hundred and seventy-three births, manual extraction of the placenta was only resorted to in three cases. There was only a slight loss of blood and the convalescence was generally normal. Under no circum-

stances, unless imperatively demanded, should expression be used within an hour and a half of the delivery of the child. In cases where flowing continues, massage of the uterus and an earlier expression of the placenta may be necessary.

Winckel,⁶⁹_{Aug.23} Lahs, of Marburg,⁶⁹_{July 19} and Dohrn, of Königsberg,⁹⁵_{184,32,11,3} favor the expectant method of treatment, and Vincent¹⁵¹_{Jan,1} insists upon it that non-interference should always be the rule and interference the rare exception. On the other hand, Pinard¹²²_{Apr.} is not inclined to wait longer than half an hour, at the end of which time the placenta should come away unless there be inertia, which is best treated by a hot antiseptic intrauterine douche, or there be a placenta retained within a contracted uterus, which in his opinion renders interference necessary.

Fronoff¹⁵¹_{Jan,1} reports two cases of adherent placenta occurring in the same woman. The placenta could in neither case be removed, but the patient made a good recovery each time. Antiseptic injections were used very frequently. At first boracic acid every hour and later every two hours. Subsequently corrosive sublimate (1-2000) was used every two to three hours, and carbolic acid injections twice daily.

P. Durozicz¹⁷_{Mar.7,13} believes that most pathological conditions of the placenta are due to diseases in the blood-vessels. The most common conditions are those of calcareous deposits and fatty degenerations. These conditions may often be suspected from an examination of the arteries in other parts of the body and from an attention to the heart sounds. He calls attention to the fact that the uterine souffle can only be heard in chlorotic women. When the anæmic murmur is heard in the neck, one may expect to hear in proportional strength the uterine souffle.

Séjournet⁴⁸_{Oct.} reports five cases of post-partum hæmorrhage which yielded at once when the abdominal aorta was compressed by the hand introduced within the uterus. In these cases the usual methods of treatment had failed.

Vincent²¹¹_{Mar.24} relies for the prevention of post-partum hæmorrhage on warm antiseptic intrauterine injections. In cases of inertia after labor where there is a tendency to delay in the expulsion of the placenta, he has found that uterine contractions are readily produced by a stream of antiseptic fluid directed just within the cervix uteri.

Alluding to Dührssen's statement as to the value of tamponing the uterus for post-partum hæmorrhage, Schücking⁴_{Sept. 17} strongly indorses that method of treatment, and claims that the packing of the uterus with antiseptic gauze is one of the most efficient means at our disposal for the checking of hæmorrhage.

M. Kortüm³¹⁷_{No. 6} advocates the same method, but thinks that the best agent to be employed is gauze moistened with a 3 per cent. solution of creolin. Chazan¹³⁷_{Oct. 15} reports three cases in which a tampon had succeeded. He believes, however, that massage or the use of hot and cold douches are to be preferred, for the use of tampon is dangerous unless the strictest attention be paid to the use of antiseptics.

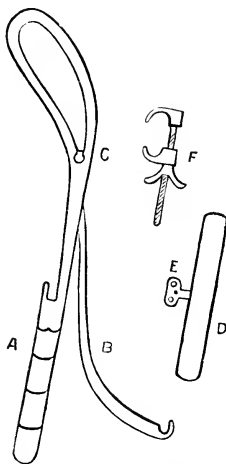
FORCEPS.

R. Milne Murray³⁶_{Nov.} gives an account of experiments made with a view of ascertaining the effects of compression of the foetal skull. The results have a most important bearing on a subject about which most authorities have unquestionably held an erroneous opinion. It has always been taught by the majority of writers on the application of forceps that compression in an antero-posterior direction by the forceps-blades results in a corresponding widening of the transverse diameter of the head. Hence, in cases of flat pelvis, where the conjugate is more or less narrowed, it has been considered a questionable practice to attempt to apply the blades over the occiput and sinciput. Dr. Murray, having succeeded in delivering a case by the application of the forceps in this way, performed a series of experiments which demonstrated that under a pressure which produced a moderate amount of antero-posterior reduction there was no increase in the transverse diameter, and that even under an extreme and even mutilating degree of antero-posterior reduction there was only the slightest increase transversely. This is explained by the fact that under compression the occipital and frontal bones slide under the posterior and anterior borders of the parietal bones, and thus the head becomes, as it were, telescoped from before backward. The contents of the skull are accommodated by an elongation of the skull in a vertical direction. Should the blades of the forceps be applied otherwise than in the antero-posterior diameter, this telescopic adjustment is more or less interfered with.

By the use of axis-traction the operator is able to apply trac-

tion nearer the true axis of each individual pelvis, the blades being applied as nearly as possible over the occiput and sinciput. As Dr. Murray forcibly says, the virtue of axis-traction forceps lies in the fact that "they enable us to deliver suitable cases with *less* because with *better-directed* force—not that they permit us to deliver *unsuitable* cases by the use of *additional* force."

Lepage²³⁶_{Max} believes that in all cases in which it becomes necessary to apply forceps at the superior strait the blades should be applied over the ears, and not as recommended by Murray. In many cases it must, however, be extremely difficult, if not impossible, to so apply them.



A, forceps; B, rod; C, button by which rod is attached; D, traction handle; E, swivel-bar to compensate for any difference in the length of the fenestra; F, clamp. (*Boston Medical and Surgical Journal*.)

Edward Reynolds, of Boston,⁹⁹_{p.31} has devised a new method of applying axis-traction which can be used with any ordinary forceps, as shown in the figure.

In using this contrivance the forceps are to be applied to the head in the usual method and as if axis-traction were not to be used. An assistant then makes slight traction on the handles, and the operator, passing a finger up to one fenestrum, hooks the appropriate rod into place. The other rod is attached in the same way, the forceps-handles are secured by the clamp, and the transverse handle is hooked on, when the instrument is ready for use,

and is then similar in its action in every way to the models of Simpson and Felsenreich. I have used this method of applying axis-traction with great success, but have found it easier to attach the rod to each blade before introducing the latter within the vagina.

In cases where it is necessary to apply forceps to the head at the superior strait, on account of a contraction of the antero-posterior diameter, Drs. McLean and H. T. Hanks²⁷_{Apr.} believe that the better practice is the operation of version with forceps to the after-coming head if it should be found to be necessary.

Van Ahlfeld⁶⁹_{Nov. 23 to 27} discusses the value of forceps, and comes to the conclusion that in ordinary practice they are altogether too frequently used. In three hundred and eight cases he believed himself justified in using them only three times.

Alluding to the fact that it is not so very uncommon to see paralysis of the arm follow the use of forceps, Budin¹⁸⁵_{Sept.} advises that in applying the blades great care should be taken not to push them on too far lest the ends of the blades compress the brachial plexus, thus causing a paralysis of one or both arms. While this form of paralysis is usually transient, if neglected it may become permanent. In all such cases friction with some warm emollient like camphorated oil should be used, and if relief does not speedily follow a resort should be had to electricity.

M. A. Herrgott¹⁸⁴_{June 15} claims that it is much safer to use forceps in the extraction of a breech case than it is to attempt to deliver with hooks. In all cases where the breech presents, the feet being drawn up above, it will be found easy to apply the forceps and the extraction will be perfectly practicable. The use of hooks is dangerous, and the liability to the production of fractures is very great. In the application of forceps to the breech one should follow the directions given by Stoltz and Tarnier.

BREECH PRESENTATION.

Pajot¹²²_{Mar.} believes that the presentation of the breech is only slightly more dangerous for the mother than the usual cephalic presentation. To attempt to change such a presentation by means of version is, in his opinion, a dangerous procedure. On the other hand, Loviot claims that there is no danger whatever if the version be performed by external manipulation, the woman being placed under an anæsthetic. It would seem as though the danger to the

mother, when the operation is thus performed, must be greatly exaggerated by Pajot. There can be no question that the rate of infant mortality in breech presentations would be greatly reduced if Loviot's advice were more generally followed. Not only is danger to the child's life thus reduced to a minimum, but in all cases where the head is born last, as in breech cases, or as the result of version there is always some danger of paralysis of the upper extremities. In efforts to extract the after-coming head, as Budin has shown,¹⁸⁵_{Sept.} the extremities of the two clavicles are so pressed back as to cause pressure on the fifth and six pair of nerves. Such paralysis has been seen to follow a breech case, even where there has been no interference. Schultze reports⁹⁵_{Vol. 32, 11.3} a case in which complete paralysis of the greater portion of the right deltoid, biceps, brachialis internus, supinator longus, infraspinatus, and supinator brevis followed the extraction with difficulty of an after-coming head in a breech case. Suckling²_{June 16} states that he has frequently seen at the Children's Hospital marked paralysis follow operative delivery of an after-coming head. In such cases he has found the paralysis to be usually very marked and more or less permanent. This last statement may be due to the fact that only those cases which had proved to be chronic in character would come under Dr. Suckling's care at a hospital, for, as a rule, the lesion, if not neglected, is transitory.

In case the after-coming head be arrested at the inferior pelvic strait, Budin³_{Dec. 25, '87} advises that the child be laid upon the left forearm with the index and middle finger in the mouth of the child, and that the right hand grasp the shoulders on either side of the neck. In this way the head can be made to pass under the pubic arch, the diameters passing in the following order: suboccipital mental, suboccipital frontal, and, finally, the suboccipital tregmatic. With a view of avoiding any possible injury to the lower jaw, it would seem safer to place the index and middle fingers on either side of the nose. Budin objects to this method being called after the name of Veit or Veit-Smellie, inasmuch as it was in practice long before the days of either Veit or Smellie. He favors the name of Mauriceau, who first brought this method back to notice after a long period of oblivion. Budin believes that in almost every case this method of extraction will be found to be effective. When it fails, the failure is generally caused by the contraction and sometimes

the retraction, also, of the cervix, by prolonged uterine inertia, or by a rigidity of the perineal floor. Whatever be the cause, the head should be at once delivered by forceps.

Placenta Prævia.—Charles P. Noble¹⁹_{May 19} considers that the cause of the hæmorrhage during pregnancy must be considered the same as where hæmorrhage occurs during gestation with a normal attachment of the placenta. Intermittent contractions of the uterus are present during the greater part of pregnancy, and such contractions affect the cervical as well as the fundal portions of the uterus. Any unusually strong contraction will, therefore, produce a laceration which will give rise to hæmorrhage. During labor the hæmorrhage is caused by the loss of relation from dilatation of the os and lower uterine segment. As regards treatment, he favors the induction of labor after the seventh month, and before that period if the hæmorrhage is severe, continuous or frequently recurring. Should the vertex present, the placenta being marginal or lateral, the membranes should be ruptured, after the os uteri has been dilated by Barnes' bags, and the case either left to nature or subsequently terminated by forceps. Should the placenta be complete or partial, combined version with slow extraction is advisable. The tampon should never be used, unless with a view of gaining time for more efficient measures. *Accouchement forcé* is to be condemned, and complete detachment of the placenta is poor practice for both mother and child. Ergot is of value, but not until the os uteri is fully dilated. Internal podalic version is to be tried only after combined version has failed. Forceps applied high up or within the uterine cavity are contra-indicated.

G. T. Harrison⁴⁰_{Mar.} believes that when the placenta is normally situated it is detached, owing to the contractions of the surface of attachment, while in placenta prævia the detachment follows from the extension of the site of attachment. If the bag of membranes is intact, the placenta cannot change its position, and, consequently, each uterine contraction detaches portions of the placenta. Should the membranes be ruptured, the placenta can retract with the uterine body and no further hæmorrhages take place. The best treatment is, therefore, to rupture the membranes and perform combined version, leaving the expulsion of the child, if possible, to nature.

John Morris,¹⁰⁴_{Dec. 24, '87} of Baltimore, severely criticises the expectant

method of treatment and advocates the immediate emptying of the uterus as soon as the diagnosis has been made out, no matter what the stage of the pregnancy may be. In cases of complete placenta prævia the entire separation of the placenta is the safest and best practice. In partial placenta prævia it will often be found sufficient to partially detach the placenta. If, however, the hæmorrhage continues, the whole mass should be removed and the delivery effected. The colpeurynter is the only safe tampon to use and the bimanual version the best method of emptying the uterus.

L. E. Neale, of Baltimore, ¹⁰¹_{Dec. 24, '97} strongly emphasizes the necessity of immediate delivery and also favors, whenever possible, external version, or, this failing, bimanual or internal version, the extraction thereby of a foot, and the subsequent leaving, if possible, of the case to nature. In partial placenta prævia, labor having fairly begun, he advises immediate rupture of the membranes.

As regards the best method of treating cases of placenta prævia, Obermann ⁹⁵_{181, 32, H. 1} gives a summary of sixty-four cases which occurred in Credé's clinic at Leipsic from the beginning of the year 1883 to the end of 1887. Of the mothers seven (11 per cent.) died, and thirty-four (53 per cent.) of the children were lost. Of these sixty-four cases, forty-nine were delivered by means of combined version and slow extraction, but one of these was almost moribund when she entered the hospital and could not have been saved by any method of treatment. Of the remaining forty-eight, all the mothers were saved with one exception, or a mortality of 2.1 per cent.; thirty of the children (62.5 per cent.) were lost. On the other hand, fifteen cases were not delivered in this way, and of these cases five of the mothers (33.5 per cent.) were lost; no mention is made of the fate of the children. It should be added that of the forty-eight children seventeen were under seven months, and, if we leave these out, we have thirty-one children with only thirteen deaths, or a percentage of 42. Dr. Obermann also reports the results in fifteen cases which occurred in his own practice, and which were treated by version and slow extraction. All the mothers were saved. He strongly advises, therefore, that version should, whenever possible, be performed, and that traction should be employed until the pressure of the child acts as a tampon. During the extraction uterine massage should be practiced. In no case should the expectant method be

employed, but the moment the diagnosis of hæmorrhage with placenta prævia is made out, the case should be operated upon.

On the other hand, Nordmann⁹⁵_{B4.32.H.1} is inclined to favor a more expectant line of treatment, and gives the result of forty-five cases which occurred in Leopold's clinic at Dresden. He divides the cases into three groups, according to the method of treatment followed. The first group, fifteen cases, were treated by the use of the colpeurynter and spontaneous delivery; all the mothers were saved and the infant mortality was 16.6 per cent., leaving out those cases in which the child was known to be dead when the case first came under observation. In the second group, twenty-three cases, a foot was brought down and the child immediately extracted; four of the mothers died (17.3 per cent.), and the infant mortality, estimated as before, was 5.8 per cent. The third group, six cases, were delivered by version, a foot being drawn down and the case being left to nature or to subsequent extraction. Two of the mothers and all the children died. In one case the mother aborted early in pregnancy and made a good recovery.

Anderledy¹⁹⁷_{Dec. 15, '87} advises that the placenta be roughly torn off instead of being carefully peeled off, as by the former method there is much less danger of hæmorrhage.

Kramer³⁹³_{B4.14.H.2}⁵_{Sept.} reports a case of complete placenta prævia in which turning had just been accomplished, when, following a uterine contraction and contraction of the abdominal muscles, the patient suddenly died from air-embolism.

ECLAMPSIA.

The profession is not yet in accord either as to the etiology or the treatment of puerperal eclampsia. Santos⁹⁵_{B4.32.H.3} from a careful study of fifty-three cases which have occurred in the clinic at Budapest, believes that albuminuria occurring in pregnancy is the result of a reflex irritation of the sympathetic and renal nerves. This irritation is due to the irritation of the uterine nerve incident to its enlargement, and later to its contraction and retraction. Eclampsia is, as it were, an acute peripheral epilepsy, having its origin in the uterus. Albuminuria is, according to his idea, a physiological condition in pregnancy, and, in fact, is of diagnostic value. With this view in mind it is easy to see how Santos would explain those rare cases in which eclampsia is reported to have

occurred without albuminuria. F. W. Robbins²³⁴_{Jan.} agrees with Lusk that it is renal insufficiency, and not albuminuria, which causes uræmia and subsequently convulsions.

Pajot,²²_{Aug. 25} while admitting that there is much that is not yet understood in reference to eclampsia, declines to admit its dependence on albuminuria. He believes that the cause is reflex, culminating in a cerebro-spinal centre in close proximity to the disorganized centre which presides over the existence of albuminuria. The lesion is not a question of degree, but of kind. He is led to this conclusion from the following considerations: (1) that the certainty of the occurrence of eclampsia is not proportional to the intensity of the albuminuria; (2) that many women who are highly albuminuric do not have eclampsia, while others, whose urine contains only a trace, die in a comatose condition; (3) that women have died from eclampsia, and yet no trace of albumen has been found in the urine. Such cases, he admits, are extremely rare. In other words, he believes that albuminuria simply predisposes to attacks, but does not act as the exciting cause.

As regards treatment, authorities on the subject are still at variance. Veit⁴⁰¹_{No. 394; Apr. 25} writes that for thirty years preceding 1886 he had always considered that the most important thing to be done in treating a case of eclampsia was to induce deep and prolonged narcosis. For this purpose he was in the habit of giving subcutaneous injections of morphia, while at the same time he placed the patient under chloroform. Although the dose of morphia was often a very large one, he never saw any injurious effect on the child. In this way he treated more than sixty cases. Since 1886, when he had the misfortune to lose two cases, he has directed his attention more to the condition of the kidney, and he now relies upon hot baths and other means, as practiced by Liebermeister and Breus, with a view of inducing diaphoresis. He has also employed pilocarpine. Wet sheets he has not found so effectual, although recommended most highly by Jaquet and Polster.

In some cases it is necessary to combine narcosis with diaphoresis, but the chief reliance should be on the latter.

Fayette Dunlap¹²_{Apr.} favors the rapid emptying of the uterus in cases of eclampsia. He quotes, as bearing him out in this advice, statistics which show that 50 per cent. of all women who have eclampsia before labor perish, and that about 90 per cent. of the

children are lost. Charpentier, Pajot, and Tarnier are opposed to the induction of labor, while Lusk favors it.

F. W. Robbins²³⁴_{Jan.} advises the administration by the rectum of a drachm of chloral, which can be repeated in from two to four hours, as occasion requires. In this method, he follows Frazer, who has collected the reports of forty-nine cases treated exclusively by chloral, with a mortality of only 4 per cent.

Engelmann⁶⁵_{Mar.} believes that a great deal can be done in the way of warding off a threatening attack. He strongly favors, when the symptoms point to future trouble, the use of digitalis, iron, and salts for the bowels. Under this treatment he has seen the albumen disappear from the urine and the general symptoms decidedly improve.

W. B. Chase¹_{Dec. 24, '87} favors the use of croton-oil or elaterium and the application of dry cups over the kidneys. Digitalis, lithia, and chloral are also of great value. He opposes bleeding except in marked cases of cerebral plethora. He also speaks favorably of the use of veratrum viride.

Bompiani⁹_{Dec. 15, '87} reports on the use of oxygen in two severe cases of eclampsia. In the first case, a fatal one, he endeavored by its use to remove the asphyxia and lung difficulty, but with only partial success. In the second case, however, the most marked benefit followed in removing the œdema, anasarca and eclamptic symptoms.

Charles Jewett³¹_{Feb. 15} strongly recommends the use of hypodermic injections of veratrum viride in doses averaging from ten to twenty minims (0.65 to 1.3 grammes), the smaller dose, repeated in half an hour, usually being sufficient. He claims that convulsions will not occur while the patient is so far under the effect of the veratrum that the pulse is below sixty. The pulse-rate once being reduced, it can be so maintained by a five-minim (0.32 gramme) dose, given as occasion requires.

In confirmation of his views Dr. Jewett reports a series of twenty-two cases, in only one of which did a convulsion occur after the treatment was established. In no case was any deleterious effect observed to follow the use of the drug. Occasionally there was a temporary nausea and depression, but these soon passed off. It is fair to add that in the majority of cases other measures were used as supplementary. Similarly satisfactory results have not, however, been obtained⁴⁰_{Feb.} from the use of veratrum viride in England.

RUPTURE OF THE UTERUS.

H. J. Garrigues,⁹_{Mar.3} in cases of rupture of the uterus, advises the operation of laparotomy, provided that extraction through the natural passage cannot be easily effected. The fact that to effect such an extraction it may be necessary to use the cephalotribe or cranioclast would, of course, in some cases raise a possible question which might necessarily turn on the religious belief of the parties concerned. Porro's operation has not been successful under such circumstances. Leopold⁴⁹_{July 26} takes the ground that if the child has escaped wholly or to a great extent into the abdominal cavity, no other operation than laparotomy should be for a moment considered. In those cases in which it would be possible to extract *per vias naturales* by traction on the feet he believes the attempt should never be made, as it is liable to still further injure the uterus.

Battlelmer, of Carlsruhe,²⁷_{Oct.} reports that he has twice done Caesarian section on the same woman after rupture of the uterus. C. M. Green, of Boston, and McLean, of New York, both report²⁷_{Apr.} cases of ruptured uteri in which the woman in a subsequent pregnancy was delivered by version. C. M. Green²⁷_{Oct.} also reports four cases which he collected, in which recovery took place, and he believes that the prognosis is good if the patient does not die of hæmorrhage or shock at the time of the rupture.

INVERSION OF THE UTERUS.

Our corresponding editor, Prof. G. H. Van Der Mey, of Amsterdam, gives a synopsis of a paper by D. D. Büchler, the result of a careful observation of cases occurring in the clinic at Amsterdam. As regards the etiology of this accident, Büchler considers that its chief factors are a relaxation of the walls of the uterus, enlargement of its cavity, and a power which, acting upon the uterus either from without or from within, forces the fundus downward. This becomes evident when it is noted that the accident almost always occurs immediately after the expulsion of the child and during the delivery of the placenta through forcible attempts to deliver the latter, either by forcing down the fundus or by pulling upon the cord, especially when it is unusually short. Inversion may also occur when the walls of the uterus are released. Rokitsky has called attention to the fact that inversion often begins

at the placental site. He agrees with Barnes that cases will occur even in the hands of the best practitioner.

When the flaccidity of the uterus is extreme, a strong pressure of the intestines may produce inversion. Büchler, however, contradicts the opinion of Denucé, who thinks, also, that when the uterus has contracted, an increased intra-abdominal pressure can cause the inversion. He cites the theory of Radford and Tyler Smith, who found the cause of inversion to be *activity of the inverted part, with simultaneous flaccidity of the parts beneath*. This theory was rejected by Duncan and Spiegelberg, who believed that the inverted part was always passive, and that by pressure, exerted upon the fundus from without, by the intestines or by the hand, forcing it down, or by dragging upon the placenta by the cord, the uterus could be inverted. When the flaccid part of the wall of the uterus is inverted, its uninverted body will be called in action and propel the inverted part downward (*active inversion*).

Büchler describes three degrees of inversion. In the first the fundus or any other part of the body is simply turned inside-out, but has not yet come through the os internum. In the second the body has appeared at the os in the vagina. In the third the organ has passed the rima vulvæ, the inversion being there complicated with inversion of the walls of the vagina.

In the cases of simple depression, the space between the bladder and the rectum is filled up by the uterus, the fundus of which shows a smaller or larger cup-like depression. In the two last degrees the uterus has wholly disappeared from its usual place, so that a wide, funnel-shaped space between the bladder and the rectum is formed, the walls of which extend to the sides of the pelvis.

Gradually, by the involution of the inverted uterus, the funnel becomes smaller and narrower; by the retraction of the ligaments, the ovaries and the abdominal ends of the tubes are drawn back to the abdominal cavity. There are, however, exceptions. Svensson,³⁷²_{Bd. 21, H. 2} for instance, amputated in a case of complete, irreducible inversion of the uterus three months after delivery, and found in the extirpated mass both the ovaries and the greater portion of the broad ligament. Occasionally, though seldom, there is strangulation of intestines by the contractions of the cervix.

Gérard relates such a case. In a few cases the walls of the funnel grow together and so prevent the removal of the append-

ages. The inverted uterus forms in the vagina a rounded, dark-red colored, roughened mass, which bleeds very easily when touched. On following the tumor with the finger we find that it becomes smaller, and that it is connected by a pedicle with the remaining portion of the cervix uteri. Immediately after the delivery, the flaccid cervix uteri can also be wholly inverted; a hardly raised ring then indicates the place where the mucous membrane of the uterus goes over to the mucous membrane of the cervix.

The third degree is characterized by the simultaneous, either partial or complete, inversion of the walls of the vagina. The deep funnel, then formed between the bladder and the rectum is divided in two by an annular groove. In the lower smaller space the round ligaments of the uterus and the uterine ends of the tubes are found, whilst in the upper and larger cavity we often meet with intestine, a cystocele, and even a rectocele.

In the cases of inversion resulting from growths, the tumor, situated in the vagina or one of the vulva, does not present the regular round form characterizing inversions of the puerperal uterus. The fibroid is almost always sessile.

The cases related by McClintock prove, however, that small pedunculated tumors can also cause an inversion of the womb. The fibroid generally arises from the fundus, very rarely from another part of the wall of the uterus. The funnel in these cases of inversion is usually very narrow. The weight of the tumor and the contraction of the walls of the uterus, increased by intestinal pressure, makes inversion, caused by fibroids, almost always very considerable.

Symptoms.—The chief symptoms of complete inversion of the puerperal uterus are collapse and hæmorrhage. Hæmorrhage may not be present, however, when the placenta is still attached. The bleeding can be arrested when the uterus, after the inversion has contracted, or the inverted organ is firmly compressed at the cervix. Simple inversion often reduces spontaneously; frequently, however, the uterus, by the contractions of its walls and the pressure of intestines, is forced externally. In these cases of chronic inversion the uterus soon becomes smaller; the chief symptom, bleeding, remains, and the mucous membrane of the inverted uterus often shows large ulcerations. In these cases death can occur by the repeated bleedings or by septicæmia. The inverted uterus,

strangled by its own cervix, is sometimes sloughed off. It is by no means rare, however, that the symptoms are not severe, and that after complete involution the inverted uterus becomes very tolerant. Spontaneous reposition of the completely inverted uterus is observed by Spiegelberg. Büchler relates the cases of Thatcher, Meigs, and Shaw, where also spontaneous replacement of the inverted uterus took place. The inversion of the uterus, independently of pregnancy, occurs usually at a more advanced age. Here, also, the chief symptoms are pain and profuse bleedings, interrupted at intervals in the early history of the case.

Diagnosis.—The diagnosis of recent puerperal inversion is very easy, especially when the placenta remains attached. Several cases have been reported in which the inverted mass was mistaken for the head of another child, for the placenta, or for a polypus. The diagnosis of chronic inversion may be more difficult, especially in the cases of incomplete inversion.

The following characteristics for the differential diagnosis are noted: In the case of inversion it is impossible to feel the fundus through the abdominal wall; on the contrary, the hand will feel a cup-shaped depression formed by the inverted uterus. A tumor is felt in the vagina. On passing a finger upward to the root of this tumor we find, if the womb be inverted, a groove which arrests the finger or the sound, which cannot be introduced into the uterine cavity. The polypus has a lateral, not a circular, insertion. On pulling the tumor down, the circular groove becomes shallower. Denucé calls attention to the particular sensibility of the mucous membrane of the inverted uterus, whereas the polypus is not painful to the touch. Acupuncture causes much pain in the cases of inversion and none in the polypus. Usually the polypus is much larger than the inverted uterus, except in cases of recently puerperal inversion.

Treatment.—Büchler calls attention to the great number of methods proposed for the reposition of the inverted uterus. Inversion of the uterus is so rare that one observer seldom acquires a large experience. Therefore a successful result obtained in one case may easily lead the operator to believe that his method is the best.

The reposition of the recently inverted puerperal uterus, in most cases, is very easy, but can become difficult by the contrac-

tions of the os or by swelling and inflammation of the uterus. The inversion should, therefore, be reduced as soon as possible.

In regard to the question whether, in cases where the placenta still remains attached, the placenta should be detached first or not, Büchler thinks that hæmorrhage must decide. If the flooding is profuse, he thinks it better to detach the placenta first and then to return uterus. The reposition of the inverted puerperal uterus is facilitated by anæsthesia. The experience of a great number of gynæcologists is that, even after a duration of months and years, reduction is possible. Reduction in most cases is simply a question of time. Büchler refuses the advice to attempt reposition during menstruation. The congestion of all the parts of the genital organs at this time induces a predisposition to inflammation and increases the danger of flooding. Moreover, the increase of the bulk of the inverted uterus during the menstrual congestion will render reduction more difficult.

Büchler then treats the different methods for the manual and instrumental reposition. Among these he particularly mentions the uterine reposer of White, the action of which instrument is compared to that of a third indefatigable hand, and by which a continual but not violent pressure can be exerted. The action of the uterine reposer corresponds to that of the colpeurynter of Braun. Tyler Smith observed a case of twelve years' standing which he was able to reduce by colpeurysis.

When reposition is impossible and the state of the patient becomes unfavorable by the repeated and profuse floodings and secretions, removal of the inverted uterus is indicated. Among the means, the elastic ligature, followed by amputation, is recommended by Büchler. He favors the operation suggested by Gaillard Thomas, who, after laparotomy, dilates the cervical ring externally and then reduces the uterus by internal pressure.

CRANIOTOMY—ABDOMINAL SECTION—INDUCTION OF LABOR.

The discussion as to the possibility of avoiding operations which are destructive to the life of the fœtus is still continued. Skillful operators and conscientious observers of facts still argue on both sides of the question. The use of antiseptics in the practice of abdominal surgery and the various modifications which have been made in the methods of operating have unquestionably done much

to limit the number of cases in which destructive operations are justifiable. That such operations, however, can always be avoided has not yet been proven. Compared with the statistics of only a few years ago the results now obtained are remarkable, but, as Wyder⁹⁵_{B4,2,H.1} remarks, Credé's assertion that the time has come when craniotomy upon the living child must be replaced by Cæsarian section is, at present, at least, premature. That Cæsarian section should be performed even more frequently than it is cannot be denied, but for its performance antiseptic surroundings, competent assistants and an operator familiar with the technical details of the operation are needed. These cannot always be found, nor is it always possible to move the patient so as to obtain these requisites for success. To be successful the operation must also be performed early and not as a last resort, and when the patient is almost *in articulo mortis*. So long as the performance of abdominal section requires, at least, two or three assistants, and a proper regard to the use of antiseptics and the condition of the patient, Cæsarian section cannot entirely supersede craniotomy. Wyder⁹⁶_{May} claims that no one has a right to assert that Cæsarian section should be entirely substituted for perforation while the mortality of the former operation is double that of the latter. In cases of deformed pelvis the three alternatives are—induction of labor, craniotomy, abdominal section in one form or another. It may not yet be possible to speak with absolute confidence as to what should be done in any given case, but, as evidence bearing on the problem, certain facts have been brought forward by reliable observers during the year. I agree entirely with Breisky and Spiegelberg that before undertaking the operation of Cæsarian section it is necessary to consider the size of the fœtus and its position in the pelvis. The measurements of the pelvic diameters, especially of the conjugate, are not sufficient to warrant us in assuming that there is a disproportion between the size of the fœtus and that of the pelvis through which it has to pass. As regards the method of operating, when some form of abdominal section has been decided upon there can be no question that a modified Cæsarian section is to be performed; unless, indeed, with a view of avoiding future pregnancy, the operation known as Porro's is indicated. There has been much written recently as regards the modification of the Cæsarian section known as Säger's, but it seems at least questionable whether any

one man's name can fairly be attached to the operation as it is to-day performed. Garrigues⁵_{May} calls attention to the fact that at the meeting of the German Gynecological Society, held at Munich in 1886, Kaltenbach asked what was left of Säger's method after the undermining of the peritoneum and the excision of the muscular tissue had been given up, and silk and silver had proved to be of about the same value. All that Säger, who was present, had to answer, was⁹⁵_{V.28,p.463} that he had recommended the use of numerous sutures, that he had rejected absorbable material for suturing, that the decidua should not be comprised in the suture, and that he laid special stress on an exact sero-serous suture. But every single one of these points has been borrowed from others; numerous sutures and the combination of deep muscular and superficial peritoneal sutures were used in fibroids of the uterus by Spencer Wells and by Kehler in Caesarian section; catgut had been rejected. Langren had avoided the decidua as early as 1875, and published the fact in 1880.

Zweifel⁹⁵_{B4.31,II.2} does not consider a resection of the uterine tissue necessary, even in cases in which there is difficulty in bringing together the edges of the peritoneum. He believes there is less liability of adhesions between the intestines and uterus when the superficial sutures are omitted.

In a most valuable monograph are collected the results which have been obtained at the Dresden Clinic by Leopold, Korn, Löhmann, and Präger.³¹⁷_{No.19} in the varied treatments of labor in contracted pelvis. The following table gives a summary of the cases:

OPERATION.	MATERNAL MORTALITY.		Percentage of Living Children.
	Total.	Due to Sepsis.	
Induction of labor (premature) (Korn)	2.2 per cent	2.2 per cent	66.6 per cent.
Version (Löhmann)	4.8 "	0. "	59. "
Craniotomy (Präger)	2.8 "	0. "	0. "
Caesarian section (Leopold)	8.6 "	4.3 "	87. "

Wyder⁹⁵_{B4.32,II.1} gives the results of two hundred and fifteen craniotomies performed at Berlin, Halle, and Leipsic, with a mortality of 5.6 per cent, and three hundred and six cases of induced premature labor with a mortality of 3.9 per cent.

Where one has to deal with a pelvis so deformed that the birth of a living child at full term is out of the question, except by abdominal section, the induction of premature labor is, of course, the operation indicated. Gussierow⁹⁵_{BL-32, II 1} divides the indications for the induction of premature labor into two classes—those which have absolute and those which have relative indications. In the former class he includes those of narrow pelvis (where the conjugate is more than 7.5 centimetres), and where there is difficulty at the end of labor, and without any reference to whether the mother is or is not a primipara. In the latter class are included only multiparae where there is a slightly narrowed pelvis, and where the former deliveries have been very difficult, resulting in the death of the fetus. The operation of Caesarian section, Wyder believes, should only be performed in hospitals and by skilled operators. He, moreover, does not favor the performance of Caesarian section in primiparae where there is only a moderate degree of pelvic narrowing, for one cannot feel sure how difficult or how easy the birth may be if the case be left to nature.

In a letter received under date of December 21, 1888, Robert P. Harris, of Philadelphia, gives the following report of the Caesarian sections performed in the United States during the year 1888 up to the date of the letter.

The Säger-Caesarian operations of the United States during 1888 number twenty-three, with fourteen women and three—perhaps four—children lost:—

January 13th, R. B. Norment, Baltimore, woman died, child lived.⁹_{Feb. 11}

February 21st, James H. Etheridge, Chicago, woman died, child lived.²⁷_{July}

February 24th, H. J. Garrigues, New York, woman recovered, child lived.⁵_{May}

March 1st, W. M. Polk, New York, woman died, child lived. Communicated.⁷²³

March 6th, W. W. Jaggard, Chicago, woman recovered, child lived.⁹_{Apr. 14}

March 19th, H. H. Vinke, St. Charles, Mo., woman died, child lived. Communicated.⁷²³

April 17th, H. A. Kelly, Philadelphia, woman recovered, child lived. Witnessed.⁷²³

May 30th. H. A. Kelly, Philadelphia, woman recovered, child lived. Witnessed—not reported yet.

August 17th. W. M. Polk, New York, woman died, child lived. Communicated—not reported.

December 13th (?). W. T. Lusk, New York, woman died. Communicated—not reported.

Swięicki (Posen)³¹⁷_{May 14} discusses the various methods of treatment advised by operators who have to deal with cases involving a narrowed pelvis. He quotes Korn, who favors the induction of labor from the thirty-second to the thirty-sixth week. If, however, this time has passed, he thinks it best to leave the case to nature and then do version with forceps to the after-coming head, and craniotomy if necessary. Löhmann also favors leaving the case to nature. Should the child be lost and the mother again become pregnant, he advises that labor be induced. Präger believes that craniotomy, with strict antiseptic precautions, gives better results than Cæsarian section under circumstances which render the careful use of antiseptics impossible. Leopold considers Cæsarian section a grave operation, even in the hands of the practiced surgeon, and does not believe that it ought always to take the place of craniotomy.

Wyder believes that abdominal section would not be so frequently performed if the operator were to ask himself the question proposed by Crédé: "What would you do if the patient were your wife, sister, or near relative?"

Leopold³⁴_{No. 39, Nov.}⁵ gives the following indications for the performance of Porro's operation:—

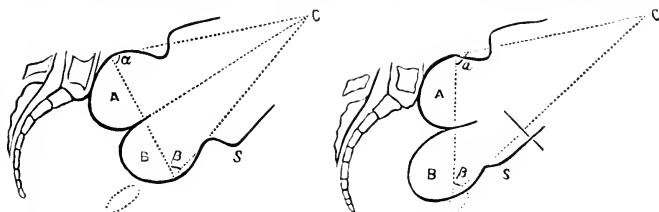
1. Infection of the body of the uterus.
2. Stenosis of the cervix and vagina by tumors not connected with the uterus.
3. In cases of myomata in the body of the uterus.
4. In pregnancy in the occluded half of a uterus bicornis.
5. In rupture of the uterus, when the child lives, in a contracted pelvis.
6. In retained placenta, with sepsis, other treatment failing.
7. In osteomalacia.

In connection with the subject of abdominal section it is interesting to allude to a case reported by our corresponding editor, Dr. Mary P. Root, of Madura, India, of a woman who, when several months pregnant, was goaded through the abdomen by an ox. She made a good recovery and went to full term.

DICEPHALOUS MONSTERS.

John Phillips^{36 Jan.} reports the abstract of twenty cases. The children were still-born and one mother died. In three cases only were there premonitory signs of an unusual pregnancy. In twelve cases the presentation was vertex (one of these being complicated with a placenta prævia), in one it was a face, and in the remaining seven the breech presented.

In studying these cases the sequence of events appears to be that the head nearest the pelvic inlet, becoming engaged, pushes its fellow on one side and fixes it. The first head is driven by the uterine contraction or is drawn by forceps into the pelvic cavity, but the second cannot, as a rule, follow, and hence the body is obstructed. The delivered head is usually pushed forward and upward under the pubic arch, the anterior surface of the neck being greatly stretched. If the uterine contractions continue



OBSTETRICS OF DICEPHALOUS MONSTERS. (*Edinburgh Medical Journal*.)

strong, spontaneous evolution may take place, the trunk passing over the perineum, and the second head is born last. Reference to the figures shown herewith will best illustrate the mechanism.

The first cut represents the two heads, A, B, squeezed together, with a transverse diameter of about six inches. Without some alteration in their relations to each other no further progress can be made. In the second figure the anterior head B, as in the general rule, has somewhat displaced A, and become well advanced in the pelvis, the angle α becoming more obtuse as B advances, while β becomes more acute. The head B may emerge naturally at the vulval orifice, and A may follow, more especially if a small head; or A may become more and more pressed against the sacral promontory, then the neck of B becomes elongated, the shoulder, S, descends and passes the pubic arch and is followed by the legs, the other shoulder, and the second head.

In breech presentations no trouble occurs until the body is born. Then, in consequence of the inclination impressed on the trunk by the axis of the pelvic canal, the posterior head engages first. With a view of aiding this advance of one head Hohl advises that one leg be pulled upward.

As regards treatment in vertex presentations before the delivery of the first head, Dr. Phillips agrees with Kleinwächter and Playfair that the expectant treatment is the best. He recommends the use of forceps when the first head is retained in the pelvic cavity, when there is placenta prævia, or when the two heads lie at the outlet. When the first head is retained in the pelvic cavity, Seanzoni and Hohl advise, if possible, version. After the first head has been delivered the second will usually be born by spontaneous evolution, either before or after the expulsion of the body. Should this not be the case, or should there be a necessity for operative interference, the head may be delivered either with the blunt hook or by forceps. In the latter case the application of the forceps may be greatly facilitated by external manipulation. It is also possible to perform version, the first head being first decapitated, unless, indeed, the neck of the child first delivered would stretch a great deal. Delivery by separation of the second head has never been attempted.

LABOR COMPLICATED WITH HEART-DISEASE.

H. D. Fry^{27 Aug} calls especial attention to the importance of an early recognition of cardiac disease in pregnant and parturient women. It is necessary to bear in mind the physiological impoverishment of the blood and the fact that pregnancy brings with it a physiological hypertrophy of an organ already perhaps pathologically hypertrophied. Metrorrhagia, abortion, and premature labor are liable to occur in cases of pregnancy complicated with heart-disease. The convalescence, after the labor is over, demands most careful treatment. Oftentimes an organic cardiac disease will exist unsuspected in the mother, until pregnancy, labor, or the puerperium give rise to alarming and even fatal symptoms. Permanent organic cardiac disease may be produced by repeated child-bearing.

Hydramnios is a frequent occurrence in these cases, and the liability to post-partum hæmorrhage is very great. As regards the

location of the lesion, Dr. Fry found the mitral valve diseased in twelve out of fifteen cases. In six only of the cases had the patient ever suffered from rheumatism. The mortality of child-bed in these cases is very high. Porak has reported thirty-one fatal cases; of these, five died before delivery, two during labor, and twenty-five afterward. As regards the management of these cases during pregnancy, the great *desideratum* is rest and every possible avoidance of exposure to cold. During the labor, the patient should be cautioned against all voluntary muscular effort and forceps should be used as early as possible. Ether should be given. Women with cardiac valvular disease should be cautioned not to marry.

D. Berry Hart^{36 Feb.} calls attention to the danger of pregnancy occurring in a patient with stenosis of the mitral valve, the pregnancy not only exerting a most unfavorable effect on the heart, bringing the patient in a few months to the most advanced stage of cardiac disease, but in such patients one is liable to have, at the completion of the third stage, a most alarming condition which may be speedily fatal. In confirmation of his views, Dr. Hart reports eight cases, seven of which terminated fatally. He strongly advises that marriage in cases of this cardiac lesion be discountenanced. During pregnancy the tincture of strophanthus should be steadily administered. Better results follow its use than when digitalis has been given. The labor should be conducted as rapidly as possible, chloroform being used if necessary. No ergot should be given. No anxiety need be felt if the hemorrhage is free, but beware if it be scanty. Should the circulation become embarrassed, the strophanthus should be pushed and dry cups applied over the heart. If this fails the patient should be bled.

J. W. Ballantyne^{36 Mar.} supports these views, which are directly opposed to those of Spiegelberg, who considers any loss of blood under these circumstances as very dangerous.

PUERPERAL DISEASES.

Involution of the Uterus.—Emile Blanc^{48 Mar.} gives the results of experiments performed with a view of ascertaining what effect the administration of ergot has on the process of involution. The experiments covered a series of nearly one hundred cases. In forty no ergot was given, in forty it was given for five days, and in twelve it was given for ten days. The ergotine was administered

subcutaneously in the abdominal wall. The cases reported upon were all at term and the labors were normal. The following results were obtained as showing the effect upon the size of the uterus:—

	Diminished.	Increased.	No change.
A. No ergotine (40 cases),	80 per cent.	10 per cent.	10 per cent.
B. Ergotine (40 cases), 5 days, 75	"	15	10
C. Ergotine (12 cases), 10 days, 74.5	"	8.5	17

The measurements were taken at the end of ten days in all the cases. From these experiments the writer draws the following conclusion: Administered during the first five or ten days after delivery ergotine exerts no favorable influence upon uterine involution, but, on the contrary, it would seem, from a number of observations, to somewhat interfere with the process. With a view, therefore, of favoring the process of involution, ergot should not be administered, but, on the other hand, in cases of secondary hæmorrhage it should be used, and its action will be the more efficacious the nearer the administration is to the time of the confinement.

On the other hand, G. E. Herman and C. O. Fowler report ^{Feb. 11} the result of experiments conducted on two series of patients. The first set (fifty-eight in number) were given ergot for two weeks after labor, while the second set (sixty-eight in number) received only a single dose of ergot after the completion of the labor. In the cases of those treated by the continuous administration of ergot the uterus diminished more rapidly in size than in those in which only one dose was given. No appreciable effect was noticed, however, as to the continuance of the lochial discharge. Dr. Boxall reported to the same society the result of a somewhat similar experiment on two sets of patients, each numbering one hundred. The administration of the ergot was, however, only continued for three days instead of for two weeks. He also found no change as to the character or continuance of the lochia, but did observe that the use of the ergot decidedly diminished the frequency, intensity, and duration of after-pains. Dr. Dakin had tried experiments in somewhat the same way and had found that the duration of the lochial discharge was shortened and the process of involution was somewhat retarded.

Duration of Lying-in Period.—II. Löhlein, ^{Feb. 9} while admitting the difficulty of ascertaining the length of time required for the completion of the process of involution after confinement, agrees with Heschl that the uterus does not obtain its normal weight until

the end of the second month. Leopold's observations tend to show that the repair of the uterine mucous membrane is not perfected earlier than the end of the fourth week. While the lochia cruenta and serosa cease the beginning of the second week, the lochia alba continue until the sixth week. Dr. Löhlein agrees with Louis Mayer that fully one-half the women who do not nurse their children and also of those who menstruate during lactation have their first post-partum menstruation within six weeks after the confinement. The repair of the vaginal walls and uterine ligaments often takes a much longer time than the uterus does. From these facts it seems evident that the period allowed for convalescence after confinement should be lengthened rather than shortened, especially if patients are to avoid the dangers of uterine displacements, chronic catarrh, inflammations, and even a subsequent sterility. The lengthening of the stay required in lying-in hospitals is especially necessary when the laborious nature of the woman's daily life is considered.

Retention of Urine.—Schatz³¹⁷_{June 16} opposes the frequent use of the catheter for the relief of retention of urine after confinement. It is not at all unusual to see a cystitis, of a more or less acute form, follow the frequent passage of the instrument. He has found immediate relief follow the stretching of the sphincter vesicæ by means of an instrument resembling a glove-stretcher. The pain occasioned by the operation is very slight and transitory. Occasionally a little hæmorrhage was observed after the stretching. In very few cases was it found necessary to repeat the operation, the patient being able the next time to pass her water unaided. He had found the same relief follow the stretching in cases of inability to pass the urine in non-pregnant women, but the results were not nearly so certain as after confinement.

Cure of the Breasts.—Recent investigations have very decidedly changed our views as to the etiology of mastitis. Every case of puerperal mastitis is now known to be due to infection. According to Olshausen⁶⁹_{Apr. 5} the bacteria find their way either through the milk-ducts or through abrasions or fissures of the nipple. In the great majority of cases the invasion is through the milk-ducts. The mastitis, which has its origin in this way, is of a parenchymatous character, while that which arises from fissures or abrasions of the nipples is phlegmonous. The retention of milk within the

breast is not *per se* a cause of mammary inflammation, but there can be no question but that the presence of bacteria will cause a decomposition of the milk thus retained, and then give rise to serious trouble.

Bearing this etiology of mastitis in mind, great care must be taken during lactation to keep the child's mouth clean and the nipple carefully washed with some antiseptic. Should there be any evidence of a threatening mastitis nursing should cease at once, and it will be found that when this treatment is pursued resolution will take place without suppuration in the great majority of cases.

F. L. Maisel²¹_{V.37,p.321; June 23} reports twelve cases of mastitis which he treated by the application of white modeling clay. The breast was first washed and covered with a piece of soft gauze. A second piece of gauze was then cut with an opening for the nipple and over this a smooth layer of well-mixed clay was spread. This was then applied over the first piece of gauze and secured in place by a bandage. This dressing was renewed morning and night. Seven of the cases in which he tried this were of parenchymatous and five of phlegmonous inflammation. Of the former only three and of the latter one came to suppuration.

Monti²⁹⁶_{Nov.4} advises that the excoriations of the nipple occasioned by nursing be painted over by a solution of gutta-percha in chloroform. This application covers the excoriations with a film, which is not removed by the application of the child to the breast.

Auvard¹⁷_{July 19} calls attention to the fact that germs may easily enter the system through fissures of the nipple, and cites in proof of his statement cases reported by Kaltenbach and Lefebvre. He would divide all fissures into two classes,—those of traumatic origin, which are easily cured by the removal of the cause, and those complicated by the presence of microbes and which show no tendency to cicatrize. More attention should be paid to the preparation of the nipples for nursing, and the writer recommends the free use of alcohol as a wash during the last month of pregnancy. In case of a fissure occurring, a nipple-shield should be used, and if it persist the fissure should be thoroughly cauterized.

Wauzh, of Liège,⁶_{Dec.24,'97} reports a case in which the administration of ten drops of the fluid extract of jaborandi every four hours to a patient whose milk had ceased for a fortnight effected a re-establishment of the secretion. The patient, however, soon

began to suffer from extreme nervous excitement with delusions. On stopping the jaborandi the nervous and mental symptoms disappeared and also the secretion of milk.

Puerperal Septicæmia.—The term puerperal septicæmia is fast crowding out of literature the name of puerperal fever, and the advocates of auto-infection are giving way to those who favor the doctrine of hetero-infection. The question whether the disease owes its origin to one organism or to several is still *sub judice*, and to the bacteriologists one must look for the solution of the problem.

Widal³_{June 29} claims that there are two organisms at least which can produce the symptoms of puerperal infection. In a paper read before the Academy of Medicine he calls attention³_{May 31} to the fact that there is no characteristic difference between the germ which produces puerperal septicæmia and that which gives rise to erysipelas. On the other hand, A. Gusserow⁹⁵_{Bd. 24, H. 2} is convinced, from a careful clinical study and experiment, that erysipelas cannot cause puerperal septicæmia. This statement would seem to be confirmed by Fehleisen, who has discovered the special micrococcus of erysipelas. His views are supported by Schönfeld and Hartmann.

Doyen¹⁰_{Mar. 13} reports a series of experiments which have led him to the conclusion that the puerperal streptococcus, the streptococcus of erysipelas and that of pus, identified by their culture, seem to be one and the same, but vary in their manifestations.

G. Jorissenne,²³⁶_{May} in his report of the work of the last three years, makes the statement that puerperal septicæmia is of the nature of erysipelas and that the typical fever is always of an erysipelatous character.

J. G. Swayne²_{Apr. 28} believes that the infection of scarlatina is capable of producing in the parturient woman a virulent fever of septicæmia, which is generally unattended with local symptoms. In this connection it is to be remembered that Meyer, of Copenhagen,³⁹³_{Bd. 14, H. 2} has published a report of an outbreak of scarlet fever in the Copenhagen Lying-in Hospital. Twenty-one cases were attacked and all ran the usual course of scarlet fever. According to John Williams,⁶_{Apr. 14} not a single case had been noted where scarlet fever occurring in connection with labor had produced septicæmia, if all possibility of septic infection had been excluded. This view is admirably maintained in a paper read by Boxall⁶_{Jan. 14} before the

London Obstetrical Society, April 4th, on "Scarlatina During Pregnancy and the Puerperal State."

Plannenstiel³¹⁷_{No. 28} made a careful bacteriological study of an outbreak of puerperal septicæmia which recently occurred at Breslau, and found that the cases were traceable to a midwife whose daughter was ill with angina tonsillaris. He believes from the study of these cases that the septic germ of phlegmon, erysipelas, and of acute affections of the larynx may cause puerperal septicæmia when transferred to the generative tract of a lying-in woman.

Writers claim that the lungs, stomach, and skin may afford a channel for entrance, and, as Leith Napier²_{Oct. 20} claims, having thus entered, the special physiological condition of the uterus render it the site of micro-organic selection for development. In this way he would account for cases of ante-partum puerperal fever. Playfair and Milne Murray agree with C. E. Underhill³⁶_{May, June} that puerperal septicæmia may arise from the patient's exposure to an atmosphere which has been contaminated by a poisoned effluvia. Fehling⁹⁵_{361, 32, 11, 3} reports an outbreak of erysipelas and puerperal septicæmia which followed the breaking down of a drain, by which the air of the ward became infected.

It would seem, however, as Kucher⁴⁶² stated in his address, delivered before the Obstetrical Section of the Ninth International Congress, that the danger from atmospheric influence is insignificant as compared with the risk of infection from contact.

How best to treat cases of puerperal septicæmia is still a question which provokes considerable discussion. That the main reliance must be on the local treatment of the uterus and generative tract, with a view of preventing still further absorption, is generally admitted.

Garrigues⁹_{Mar. 3} strongly favors the injection of a solution of corrosive sublimate (1-4000), not more than three pints being given: In giving the injection the patient should lie on the back for fear of the fluid passing through a dilated tube. Subsequently an iodoform pencil (90 grains, 6 grammes) should be introduced within the uterus. P. F. Mundé believes in the value of intrauterine irrigation, but would substitute for the mercurial solution either warm water or a 2 per cent. solution of carbolic acid. He is opposed, however, to the use of iodoform pencils.

At the Boston Lying-in Hospital the main reliance has been

placed on intrauterine injections of a mercurial solution (1-3000), care being always taken to secure a return stream and that the mercurial washing-out be followed by an injection of a solution of carbolic acid ($2\frac{1}{2}$ per cent.). After the uterus has been thoroughly washed out an iodoform pencil, 10 to 20 grains (0.66 to 1.42 grammes), is introduced.

Dolérís ²⁴_{Aug. 5} strongly advises that the uterus be curetted, although he believes that it may be sufficient to try injections, but if these fail he considers it is most unwise to temporize with irrigation, which is often found to be ineffectual, when the use of the curette will be found to be much quicker and the chances of recovery more certain.

Cosentini ³⁴_{Oct. 30} believes that great benefit will be found to follow the repeated curetting of the uterine cavity, and that that method of treatment should always be preferred to irrigation. In the *débris* first scraped out he has found great quantities of organisms, but after repeated scrapings they disappeared. In a discussion on this subject before the Italian Society of Obstetrics and Gynæcology, Meola considered this treatment by far the most rational of any yet suggested, and Candia (Naples) stated that he had used it with good success, and found the operation rendered a painless one by the use of cocaine.

Charpentier ²²_{Sept. 20} also places the greatest reliance on the use of the curette in all cases in which the temperature and local symptoms point to the probability of septic absorption taking place from within the uterine cavity.

Misrachi ²⁴_{p. 337} entirely disapproves of the use of intrauterine injections on account of the danger which he thinks is inherent to the injection itself and also to the poisonous nature of the corrosive sublimate usually used. He, moreover, believes that, were these dangers of no account, their use is of no avail, inasmuch as they neither destroy the germs nor dislodge the matter which is most favorable to the development of septic elements. He proposes the methodical swabbing out of the uterine cavity with some instruments which will remove the septic products.

Bar ²⁴_{p. 330} denies entirely the statements made by Misrachi and asks for facts which shall prove the superiority of the uterine swab over the intrauterine douche.

In cases of purulent puerperal peritonitis, in which there is

undoubtedly fluid within the abdominal cavity, there can be no question that the fluid should be promptly removed, either by aspiration, as reported by Besnier,⁴⁹_{Nov. 75} or by an incision and drainage, as reported by Woodward.

Von Jaksch¹¹³_{Nov.} believes he has seen the best results follow the administration of salicylate of soda. He strongly recommends its use in cases wherever there is observed a gradual post-partum rise of temperature. It should be given in doses of seven grains (0.47 gramme), hourly until the temperature falls, which is usually, according to his experience, in from fifteen to twenty hours. In urgent cases the dose may be increased to fifteen grains (1 gramme) hourly. Occasionally he has observed a slight mental disturbance follow the use of this remedy, but he considers this as no contra-indication to its use, as the effect soon passes off after the discontinuance of the medicine.

In connection with the subject of the treatment of puerperal peritonitis, Spillmann and Ganzinotty¹⁴_{July 1} report that great relief from the pain follows the painting of the abdomen with flexible collodion.

Puerperal Insanity.—T. Hansen,³¹⁷_{Nov. 25} from a careful study of forty-nine cases of puerperal insanity, considers that puerperal infection is the direct cause of the mental disturbance, instead of being, as many writers have assumed, only an occasional or predisposing cause. Out of these forty-nine cases, well-marked evidence of puerperal infection was found in forty-two, while of the remaining seven two were complicated with eclampsia, the mental disturbance being transitory. Twelve of the cases proved fatal.

Aphasia.—W. Luckinger³⁴_{Nov.} reports the case of a patient in whom aphasia occurred on the sixteenth day after confinement preceded by a severe supraorbital neuralgia (left side). Deep coma followed. There was no evidence of paralysis, and sensibility was not disturbed. Two hours later there were clonic spasms of the arms and body. The face was flushed. The skin warm and moist. Dyspnoea. Urine normal. Milk and lochia suppressed. Within forty-eight hours the symptoms passed off and the patient was soon well. Dr. Luckinger believes the symptoms to have been due to an embolus on the left side of the fossa of Sylvius. He reports two other similar cases in which this was the lesion.

DISEASES OF THE NEWBORN.

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NEW YORK.

TRANSMISSION OF DISEASE FROM MOTHER TO OFFSPRING.

So intimately connected with this subject as, in fact, to be an integral part of it is the consideration of the transmission of diseases and the germs which cause them from the mother to her offspring, and it would be strange, indeed, if the great strides which have been made in the science of bacteriology should leave unconsidered the earliest period of life, in which the possibilities for the transmission of disease are so ample. Waldeyer has shown that the spaces between the lobuli of the human placenta covered with epithelium contain fœtal blood, and that the fœtal tufts are, therefore, immediately bathed in maternal blood; and Bollinger³⁶⁶_{Bd. 27, 11, 4} has collated the accounts of recent experiments which demonstrate the intra-uterine migration of pathogenic microbes from mother to fœtus in connection with infectious diseases. Experiments have been made in the following diseases:—

1. Splenic fever. The bacilli of this disease do not, as a rule, pass into the placenta, and therefore do not pass into the interior of the blood-vessels unless the latter are ruptured.
2. Symptomatic carbuncle. Arloing, Thomas, and Cornevin have all shown experimentally that the bacilli of this disease can pass into the fœtal blood.
3. Glanders. Pregnant animals with this disease may bear either healthy or diseased offspring.
4. Infection from wolf-bite. The effect of this poison resembles that of malignant pustule. Several fœtuses have thus been infected *in utero*, some of them bearing evidence of the infection, while others did not. In this respect there is a parallel with the poison of variola.
5. Typhoid fever. Abortion results in 63 per cent. of cases.
6. Recurrent fever. Spitz and Albrecht have demonstrated the intra-uterine migration of the spirilla from mother to fœtus.
7. Cholera. Tizzoni and Cantani believe they have demonstrated the presence of cholera bacilli in the blood and cerebro-spinal

fluid, but Bollinger does not consider their statements conclusive. 8. Chicken cholera. Strauss and Chamberland believed that the bacteria could traverse the placenta in rabbits. 9. Septicæmia of rabbits. Kroner has inoculated the disease, but has been unable to find the bacteria in fetal blood. 10. Pyæmia. Simone found that the streptococcus of this disease passed from mother to fœtus in rabbits. 11. Tuberculosis. Charrière has proved the passage of its bacillus in human beings and Johne in calves. 12. Scarlet fever. Evidence of transmission in two cases is given by Leale. 13. Erysipelas. One case of transmission has been reported by Lebedeff.

The infectiousness of micro-organisms is principally governed by their size and motion. Other influential elements are, the duration of the disease, the condition of the placenta, and many accidental conditions.

Experiments have also been made by Perroncito and Carita^{51 Feb.} which show the communicability of hydrophobia from mother to offspring through the media of the placenta and the milk. Experiments were made upon bitches and pups, and the conclusions were not only that the disease could be transmitted from mother to fœtus, but that one fœtus in a litter might be infected while the others remained healthy.

Syphilis in the fœtus and newborn furnishes conclusive evidence, if there were none other, that intra-uterine transmission of disease is a possibility. Sturgis has stated^{51 Feb.} (and his opinion seems to be that of Zeissl, Kassowitz, Miller, Kraus, and others who have examined the subject statistically) that the larger percentage of cases of inherited syphilis appear at or before the end of the first three months of extra-uterine life. The low vitality of such infants is well known. Mracek is quoted by Sturgis as reporting nineteen cases in which the children all died at periods ranging from half an hour to forty-eight hours after birth. Various interesting lesions are connected with this disease, such as onychia in various degrees of intensity, alopecia, which may leave portions of the scalp permanently bald, eruptive phenomena of varying degrees of importance upon the skin, and gummous lesions of the viscera, especially the liver, spleen, and lungs. The mucous membrane of the larynx and pharynx may be so affected as to make the voice husky and interfere with deglutition or respiration. The lym-

phatics also may be extensively involved in the disease, especially all the lymphatic glands of the thorax and abdomen. Hydrocephalus is also a condition which accompanies congenital syphilis, the distention being sometimes in the antero-posterior and sometimes in the lateral diameter. In such cases the membranes of the brain are diseased, and if hydrocephalus does not result there may be, instead, an infiltration of guminous material with convulsions, the condition resembling cerebro-spinal meningitis. Henoeh and Roth have reported cases of transient paralysis (quoted by Sturgis⁵¹_{Feb.}) in syphilitic newborn infants, in which there may have been effusion, due to the disease, into the spinal canal.

If the experiments of Disse and Tagenti¹⁵⁸_{Bd. 9, 4 & 5} were deemed conclusive it would be settled that the contagium of syphilis had been isolated. These observers succeeded in cultivating a diplococcus from the blood of syphilitic patients in different stages of the disease and obtained results in animals which correspond with those which occur in syphilitic children. Hochsinger does not regard this microbe as essential to syphilis, but believes that the osteochondritis, pemphigus, and pneumonia alba of syphilitic children are due to streptococci in the diseased tissue, and that these are pathogenic for the diseases in question. The earliest symptoms of hereditary syphilis, according to Miller,³⁶⁶_{Bd. 27, H. 4} in default of any history which should direct attention to that disease, are unhealthy condition of the navel, prolonged icterus, rhinitis, with or without nosebleed, pemphigus, or maculo-papular eruptions of the skin. All of these are, of course, indicative of an inferior condition of vitality. Jacobi makes the point⁵¹_{Nov.} that general pemphigus of the surface in the newborn is not a symptom of syphilis, but pemphigus of the palms and soles is. In such cases the bullæ may be present at birth and contain a thin, serous fluid, which quickly becomes purulent. Another peculiarity of congenital syphilis is the frequent association with it of pneumonia. Heller considers three varieties of the latter in this connection,³⁶⁶_{Bd. 28, H. 2} gummatous, white, and interstitial. The white pneumonia is usually in premature children who are still-born or die soon after birth. This and the interstitial variety are very important in a medico-legal sense, for the presence of inflatable lung-tissue might excite suspicions of infanticide which were groundless. It must ever be borne in mind that infants with congenital syphilis readily and

frequently communicate the disease. The infant should be nursed by its mother, if possible, and should be dosed regularly and rigorously with mercury, with the addition of iodides (A. Jacobi) in some cases. The interest which is claimed by syphilis may be fairly shared by rachitis, especially in certain countries in Southern Europe, in which it is very prevalent. Intra-uterine development of the disease is of rare occurrence. Schorlan and Gräfe have collected fifty-three cases in which it occurred, and Hamill recently presented a case to the Obstetrical Society of Philadelphia⁹ Feb. 18 in which the disease was markedly developed in both femurs. Lauro summarized the subject before the Obstetrical and Gynecological Society at Naples,⁵¹ Apr. his most important conclusions being the following: Rachitis of intra-uterine life is a possibility which is established by the anatomical and anatomo-pathological lesions in the bones of newborn infants. The rachitic changes of intra-uterine life are similar and of similar origin with those which occur in extra-uterine life. These changes may invade the skeleton before the bones are fully formed, and they are not due to lesions of nervous centres with consequent muscular contraction. It is probable that the physical condition of the mother is extraneous to the development of the disease, though the existence of the disease in the mother may have a predisposing effect, to a certain degree, to its development in the child. Intra-uterine fractures and consequent deformity may be due to the existence of this disease. The deformities may even be so great as to incapacitate the fetus for performing the functions of extra-uterine life. Kehler and Bohn recognize a foetal and a congenital form of the disease, the former developing and being cured during foetal life. Of five hundred newborn infants who were examined in the Second Vienna Obstetric Clinic by Schwarz²⁶⁶ B.I. 27, H. 4 only 19.4 per cent. were free from more or fewer evidences of rachitis. Of the premature children in this series 93.3 per cent. of those who were born at the end of the seventh month were rachitic, 81.00 of those born in the eighth, and 80.6 of those in the ninth. Quisling¹⁵⁸ B.I. 9, H. 4 & 5 found the percentage of rachitic cases occurring during the first year of life, among one thousand cases of the disease at the children's clinic in Christiania, to be 47.6. The proportion of rachitic infants in the London clinics was found to be much smaller than in any of the great continental cities. It is well known that Parrot con-

sidered the disease a direct derivative of syphilis. Baginsky found evidences of syphilis in 6 per cent. of all rachitic children. Nothing has been absolutely proven regarding the interdependence of the two diseases, and the same may be said concerning the interdependence of rachitis and tuberculosis.

In connection with the subject of transmitted disease from mother to child it is interesting to note the views which have been advanced concerning the condition of the blood of the child at birth. These views are the result of the investigations of Schmidt, Kobert, and Runge, and are as follow:—

1. Coagulation of fetal blood is incomplete.
2. Fetal blood is poor in fibrin compared with maternal blood.
3. The quantity of hæmoglobin in fetal blood varies at different stages of development. At the end of pregnancy it is about the same as in the maternal blood, but it is always less than in the newborn infant a short time after birth.
4. The quantity of solid constituents in fetal blood is greater than in the maternal.

The foregoing conclusions were quoted by Krüger in his paper upon this subject,³⁶⁶ and he has added, as the result of his investigations:—

1. The increase of solid constituents in fetal blood, as compared with that in the maternal blood, is insignificant.
2. The quantity of fibrin in the fetal blood is decidedly diminished at the moment of birth and tends to diminish subsequently.
3. The quantity of hæmoglobin in fetal blood at the moment of birth is about the same as in maternal blood, but it increases from the moment of birth.
4. The sex of the fetus has little or no influence upon the composition of the blood. The same is true with respect to the weight of the fetus.
5. Fetal blood coagulates at once at the moment of birth, but the clot is a long time in forming, owing to the slowness with which the white corpuscles are broken up, and it is from the latter that the fibrin ferment is developed.

The pulse of the child immediately after birth is much slower than during fetal life, when it ranges between 124 and 150

(Keating and Edwards, ⁵¹Dec.). During the first eighth or quarter minute after birth, according to the authors just quoted, the heart pulsations are not discernible. Then they commence slowly, at the rate of 10 or 12 per minute. In the second half minute a vigorous child will usually cry, the pulse may become 160 per minute, and then is quickly reduced to 136 to 140 per minute. Immediately after birth the pulsations can be discovered only by placing the hand over the præcordia. Within a week the pulsations of the femoral and carotid and of the basilar, through the fontanelle, may be made out.

MORBID CONDITIONS OF THE RESPIRATORY TRACT.

Of the diseases of the mouth in newborn infants none is more important, perhaps none more common when bad hygienic conditions obtain, than aphthæ, or Bednar's aphthæ, Bednar having described them in 1850 in his work on "Infants and Newborn Children." The form which he describes is seen only in infants from two days to six weeks old. Forchheimer, in his paper on "Diseases of the Mouth," ⁵¹Dec., refers at length to this disease. There are five varieties, three being found on the hard palate, the fourth on both the hard and soft palates; the fifth is hæmorrhagic. They are preceded by an injection of the mucous membrane, after which there is subepithelial, grayish or yellowish-white exudation, and then there is ulceration. These formations are to be differentiated from milia of the mouth and from the retention cysts described by Bohn, which may be followed by ulceration. Epstein speaks of congenital defects in the mucous membrane of the mouth, filled with epithelial detritus resembling aphthæ. Forchheimer quotes Fischl as believing that these lesions are due to the finger of the nurse in her zeal to cleanse the infant's mouth. This explanation may serve for some cases, but it would hardly be satisfactory for the many cases which arise in the midst of deplorable hygienic surroundings, and in which cleanliness of the mouth or any other portion of the body seems to be entirely ignored. It is in athreptic, poorly developed, poorly fed and cared for infants that one is apt to find aphthæ, rather than in those for whom zealous service has been exercised.

Diphtheria of the newborn is so infrequent that no less an authority than Oertel has stated that the infantile organism is

insusceptible to it during the first half year of life. This statement is denied, however, by equally high authorities, A. Jacobi and J. Lewis Smith, the former of whom has seen three cases of the disease located in the pharynx and larynx. Smith⁹_{Sept. 8} has treated the subject in a masterly paper which was read before the Pediatric Section of the Academy of Medicine. Jacobi, in his treatise on diphtheria, refers to cases which have been reported by Sirédey, Parrot, Bednar, Bretonneau, Bouchut, and Weikert. Such testimony cannot be questioned, and it is somewhat strange that it should have been overlooked by Oertel. Smith reports five cases seen by him in the New York Infant Asylum during an epidemic which occurred this year. He considers the prognosis as very bad, but not necessarily fatal, and advises for treatment the internal use of the tincture of the chloride of iron in one- or two- drop doses, frequently repeated, together with local applications of a 1:4000 solution of sublimate. He also advises that the air of the sick-room be saturated with the vapor from a boiling solution, in which the ingredients are:—

R	Acidi carbolici,	℥j (3.89 grm.).
	Ol. eucalypti,	℥ss (15.56 grm.).
	Spts. terebinthinae,	℥vj (186.62 grm.).

Sig. : Tablespoonful to a quart of water.

Another useful precaution recommended by Smith, and applicable in cases of diphtheria in the newborn not less than in older individuals, is that the walls, floors, and furniture of the sick-room be washed with a strong solution of corrosive sublimate.

In the care and treatment of the newly born asphyxia is a condition which one is frequently compelled to meet, and the prognosis will depend partly upon the condition of the child and partly upon the treatment which it receives. A. Jacobi⁵¹_{Jan.-Dec.} has devoted a chapter to this subject in his papers on the "Therapeutics of Infancy and Childhood." If cyanosis is pronounced and the infant well developed, he approves of Grenser's suggestion to allow the stump of the cord to bleed a little before the application of the ligature, perhaps even encouraging bleeding by placing the infant in a warm bath. The suggestion that attempts to inflate the lungs may also result in inflation of the stomach is a practical one, and must have been observed by every one who has tried this method of resuscitation—mouth to mouth

or mouth to nose inflation being, of course, implied. Of all the methods for producing artificial respiration Jacobi prefers those of Silvester and B. Schultze. The use of diffusible stimulants and faradization will also be effective in many cases, and one or both of these means will in almost all cases be at hand.

Mory²¹⁷_{Mar. 3} and Furth⁵⁷_{May 6} have also contributed to this subject. The latter distinguishes two varieties of asphyxia, *A. livida, sine suffocatoria, sine apoplectica*, and *A. pallida, sine nervosa, sine anamica*, which sufficiently explain themselves. Asphyxia must be distinguished from apnœa, in which violent and frequent heart movements with undulation of the chest-wall are present.

Asphyxia may be due to atelectasis, or the latter may be post-natal, with resulting asphyxia. Atelectasis, according to A. Jacobi,⁵¹_{Jan.-Dec.} may be caused by malformations and intra-uterine diseases of the organs of respiration or circulation, or it may be due to hæmorrhage with pressure upon the respiratory centre, or to the premature and feeble condition of the infant. Acquired atelectasis may be due to penetration into the bronchial tubes of viscid mucus or of some of the products of intra-uterine life. The treatment is the same as was indicated for asphyxia from other causes.

Pneumonia may occur in newborn infants without any syphilitic history on the part of mother or child. Hirst,⁹_{Mar. 24} reports two such cases, one præ-natal and the other post-natal. The first was an eight-months child of an unhealthy mother, and lived only a few hours. The lungs were nearly solid, the air-vesicles showing desquamative pneumonia, with great increase of fibrous elements. The second child was born of a healthy mother, was slightly asphyxiated at birth, but soon revived. It breathed rapidly from the first, and refused to nurse. By the third day broncho-pneumonia was evident, and it was supposed to be due to inspiration of blood and mucus during labor.

It seems at least questionable to me whether inspiration ever occurs during labor. There is no way of demonstrating with anything like certainty that it does occur, and until the placental circulation is cut off and the stimulus of the atmosphere is felt by the child it is difficult to conceive of conditions which would admit of inspiration.

MORBID CONDITIONS OF THE ALIMENTARY TRACT.

The frequency of disease of the alimentary tract is not so great in newborn infants as in those who are a few weeks or months old; but the impaired nutrition of premature infants and the bad hygienic surroundings of many who would do poorly under the most favorable conditions make them an easy prey to the scourges, indigestion, hot weather, and neglect. Parrot has given the name of *athrepsia* to this general impoverished condition, and divides it into several periods. Children with the acute form of *athrepsia* may live from three to six weeks, in the meantime emaciating and suffering from vomiting and diarrhœa. Autopsies upon children dying with this disease show ulcerations, ecchymoses, softening and granular infiltration of the mucous membrane of the digestive tract; thromboses, interstitial hæmorrhages, and steatosis of the kidneys, lungs, liver, and brain (Sejournet, ¹¹⁸June). Congenital constipation may also exist in the newborn infant from anatomical conditions or other causes. A. Jacobi ⁵¹Jan.-Dec. refers to the unusual length of the sigmoid flexure in infants as favoring this condition, and also points out the means of relief by enemata rather than by laxatives given *per orem*. Hirschsprung also refers to this condition as the result of hypertrophy and dilatation of the colon.

DISEASES OF THE HEART.

These may be due to improper development, to irritative conditions during intra-uterine life, or to post-natal causes, but the latter are, of course, very infrequent compared with the former. Simon proposes the name, white cyanosis (*cyanose blanche*), for that condition in which there is pallor of the skin, though the ductus arteriosus is patent and arterial and venous blood are commingled in the auricles. He has seen several cases of that character, and Moul's reports ¹¹⁸Apr. a case in detail. The comments upon this case are that, although the manifest communication between the two auricles was indicated by a *souffle*, establishing the diagnosis, and though the extremities were cold, the skin was abnormally pale instead of blue. It was also remarkable that though the child suffered with double broncho-pneumonia the temperature did not exceed 38.2° C.; but this is not unusual, for individuals with cardiac anomalies never have high temperature in connection with inflammatory conditions. Harris reports a case ⁵¹Apr.

of a child dying at the age of seven weeks who was cyanosed from birth. In this case there was transposition of the pulmonary artery and aorta. The foramen ovale and ductus arteriosus were slightly open, and this was the only way by which the blood-currents could mingle. The walls of the right ventricle were thicker than those of the left.

DISEASES OF THE LIVER.

No organ in newborn infants seems more susceptible of derangement than the liver. This is readily understood when we realize the important functions of that organ during fetal life. Icterus is so common a symptom with the newborn, and, in many cases, so transitory, that it is doubtless passed over in many instances as of little importance. When it is persistent it is an indication of gravity. White reports such a case, ²⁷_{Jan.} in which the icterus was hepatogenic, the autopsy showing an absence of the common bile-duct. Congenital cirrhosis, acute fatty degeneration, and epidemic hæmoglobinuria are all incurable (A. Jacobi, ⁵¹_{Jan.-Dec.}). Icterus resulting from sepsis is usually fatal, while icterus from syphilis may be recovered from. A. Jacobi has had several cases of the latter which have recovered. Halberstam states ³⁹⁶_{Vol. 27, II. 4} that undissolved biliary coloring matter and bile salts are always to be found in the urine of icteric newborn infants, which proves to his mind the hepatogenic origin of the disease.

DISEASES OF THE NERVOUS SYSTEM.

Apart from the lesions of the nervous system in newborn infants which are due to faults of development, there are others which may be due to mechanical influences, especially pressure during fetal life in cases in which the breech presents, in those in which a tumor or other obstructions prevents free exit of the fœtus, etc. Varnier ¹⁸_{Nov.} has collected seven interesting cases in which the paralysis clearly had such an origin. Stephan ⁹²_{July} describes three different forms of peripheric facial paralysis: (1) that which is caused by the obstetric forceps; (2) that which is due to prolonged labor, faulty pelvis, or intra-pelvic tumors; (3) that which is congenital and is usually accompanied by deafness. The first two of these are usually curable, the third is incurable. Gowers ⁶_{Apr. 14-21} refers to the paralysees which are associated with parturition as

“birth palsies.” Those of spinal origin are very rare. The principal classes are (1) peripheral and (2) cerebral. The most common varieties of the former are those which involve the arm and face, the facial paralysis being usually caused by pressure of the forceps and the arm paralysis by fracture or severe pressure in delivery. Usually such paralyses are not permanent. Cerebral palsies are more frequently permanent and are usually the result of compression or other brain injury during parturition. In fatal cases Sarah J. McNutt found extravasations over the surface of the brain, including the base in some instances. The cortex was lacerated in some cases, and in those in which there was extravasation over the base the cerebellum was torn and some of its vessels ruptured.

HÆMORRHAGE.

Hæmorrhage in the newborn may be the result of diseased structures, as in melæna and purpura, certain forms of bleeding from the umbilicus, etc., or it may be due to the exercise of too much force in artificial delivery or faulty natural delivery. The most common form of hæmorrhage is that which comes from the umbilicus. It may take place before or after the separation of the cord. A. Jacobi,⁵¹_{Jan.-Dec.} suggests the use of two ligatures upon the stump in cases in which there is an obstinate tendency to bleed, or transfixion of the umbilicus with two hare-lip pins inserted at right angles to each other and with a ligature around them at the point of contact. This form of hæmorrhage is sometimes uncontrollable and fatal in spite of either mechanical or chemical styptics. Van Cott¹⁵⁷_{Mar.} and Manicus³⁶⁶_{Bd.27,H.4} have each reported an interesting case of this character. Hæmorrhage of a fatal character may be due to hæmophilia, congenital syphilis, general sepsis, or acute fatty degeneration. Menger reports a fatal case in an infant nine days old, in which the child suffered from stomatitis parasitica, and the hæmorrhage was first excited by the rubbing of the tongue with a cloth soaked in salvia tea. Other interesting cases of fatal hæmorrhage in the newborn have been reported by Machell,³⁹_{Jan.} in which there was bleeding into the stomach; Helm,¹⁹_{Feb.18} the hæmorrhage being a transudation through the skin of the palms and soles; Keser,³⁶⁶_{Bd.27,H.4} in whose case the hæmorrhage was into the peritoneal cavity; Pippingsköld,³⁶⁶_{Bd.27,H.4} the hæmorrhage being into the intestinal canal; and Hirst,¹¹²_{Oct.} the

case being one of intra-cranial hæmorrhage in the younger twin, born after breech presentation. Arteritis in the newborn may be associated with general sepsis, pneumonia, pleurisy, peritonitis, arthritis, and abscess. As it is generally of infectious origin, the necessity of antiseptic treatment of the umbilical stump becomes apparent and practical. With phlebitis, according to A. Jacobi, there is more peritonitis of the hepatic region, more epigastric tympanites, and more icterus, than in arteritis. The same remarks which were made concerning antiseptics in connection with arteritis are pertinent in this connection. Other diseased conditions to which the umbilicus is subject are phlegmonous inflammation, gangrene—in a word, omphalitis. The tissues surrounding the stump may be infiltrated, discolored, and painful; the inflammation may extend to suppuration or gangrene, and peritonitis may eventually result. These conditions may be associated with arteritis or phlebitis, and in such cases the outlook is bad enough. The treatment involves ordinary surgical principles, plenty of breast milk, and alcoholic stimulants. The bowels should be kept thoroughly evacuated, rectal enemata being used if required.

ABSCESS.

Abscesses in connection with bone in the newborn are sufficiently rare to merit attention. Thibierge reported a case at the Anatomical Society of Paris⁷_{Oct.10} in which a seven-months baby with syphilitic lesions of the femur developed an abscess of the left leg. This was incised, but gangrene of the foot and death resulted. Dujardin reports, also, an abscess of the orbit in a baby nineteen days old,⁷⁸_{Apr.30} which was punctured with a bistoury, but subsequently opened spontaneously and discharged through the mouth and nose. It is probable that the microbes of infection were communicated during parturition.

SEPSIS.

A. Jacobi⁹_{Apr.7} and J. Lewis Smith⁹_{Sept.8} have made the subject of sepsis in the newborn the basis of papers communicated by them. Who could have prophesied, twenty-five years ago, the revolution which was to take place in the doctrines concerning sepsis? We cannot estimate the value in the saving of human lives which has resulted from the development of the anti-

septic theory, and the beneficent labors of Lister, Pasteur, Koch, and others whom they have stimulated or inspired. Sepsis in newborn infants occurs most frequently through the umbilical wound, but infection may also take place through the maternal blood, by means of the maternal discharges during labor, or, possibly, by the mother's milk. Epstein describes three forms of sepsis in infants which are due to lesions in the mouth: (1) septic catarrh, which may result in hæmorrhage and other accidents, (2) croup, (3) diphtheria. This teaches that manipulation about an infant's mouth should be of the gentlest possible character. Smith observed that the manner by which poison entered the system of an infant was sometimes obscure, but that it usually entered through the umbilicus and was usually microbic. He would classify sepsis into three groups: the first group including cases of umbilical phlegmon, the poison entering the system through an umbilical wound, and being conveyed by the lymphatics; the second group included cases in which the poison probably entered through the umbilical vein; the third included those exceptional cases in which the virus entered by any other channel than the umbilicus.

TRISMUS.

A very interesting and important disease in the newborn is trismus or tetanus. Fortunately, also, it is becoming rarer as the principles of antiseptics are being more thoroughly applied in the practice of obstetrics, and it becomes understood that the umbilical wound demands the same care and attention as any other wound which provides an easy avenue for infection. Nicolaier,⁶⁹ Ohlmüller, Goldschmidt, Hochsinger, Beumer, and others have studied the disease experimentally, and Escherich, in summing up their investigations, concludes that trismus in the newborn is an infectious disease identical with Nicolaier's inoculation-tetanus and the tetanus of boys and adults. It is produced by infection of the umbilical wound by means of tetanus bacilli. The bacilli gain access to the infant by the hands of attendants, or by means of the bandage smeared with fat or oil by which the wound is covered. He also believes that the disease may be avoided if suitable antiseptic precautions are observed, including the use of antiseptic cotton, renewed daily, as a covering for the wound. Beumer's experiments⁴⁸⁵ July showed that the bacillus of tetanus was present in

great numbers in the filth and dust of the streets and the houses. It is less abundant in clean soil and in the deeper strata of earth in the streets. Peiper¹_{Mar.10} confirms Beumer's experiments and shows that trismus can be transmitted to mice and rabbits by inoculating them with portions of tissue from the umbilical wound of a child suffering with trismus. Guinea-pigs were inoculated with particles of muscle from the infected mice, and in four or five days they showed unmistakable signs of tetanus. A. Jacobi⁵¹_{Jan.-Dec.} considers that the prognosis of this disease is better than it used to be. Cases which last more than five or six days may recover. Patients with this disease should be fed through the rectum or the nose, and medicines should be given subcutaneously. Thus atropia may be given several times daily in doses of one-thousandth of a grain; curare, one-fiftieth of a grain; or extract of calabar, half a grain. Chloral may be given, per rectum, six to ten times daily, in doses of one to five grains. The very high temperature (106° to 111° F.) may be influenced by antipyrin or antifebrin, but no baths must be given.

ŒDEMA.

The somewhat rare condition of œdema in the newborn has been discussed by Professor Dumas, of Paris, in a learned paper of which the following are the conclusions:—

1. Œdema of the newborn is only one of the symptoms of a phlegmasia alba dolens which is developed during the first days after birth.

2. Its causes are of the same nature as in the adult, and may be divided into predisposing and determining varieties. Among the latter the principal one consists in the incomplete establishment of respiration, or in the pathological or other causes which this function encounters.

3. The symptoms of phlegmasia in the newborn are the same as in the adult, excepting certain modifications with respect to the special physiology of the first days following birth.

4. The pathological anatomy is also about the same, but the venous thrombosis in the newborn is more frequently located in the inferior vena cava than it is in the same disease in the adult.

5. The treatment is the same as in the adult, and there are the same dangers for the infant as for the adult. But the great relative feebleness of the infant greatly aggravates the prognosis

6. Suitable care to effect respiration in the newborn at the moment of birth and the not too hasty ligation of the cord constitute a prophylactic treatment the importance of which must never be lost sight of.

SPONTANEOUS RUPTURE OF THE LARGE INTESTINE.

Paltauf²⁰_{Mar.2} reports spontaneous rupture of the large intestine in five newborn infants. This accident is rare indeed, though it might prove less so if careful autopsies were made on all infants who die suddenly during the first few days of life. The theory which is advanced is that the tearing of the muscular coat first occurs on account of an effusion of blood which takes place between the walls of the intestine and the muscle fibres. This leads to deranged nutrition in the muscle and the changes which are caused by the mere presence of the extravasated blood as a foreign body in the muscle substance, and rupture follows as a matter of necessity. The author's theory is incomplete, for it is not easy to say what should cause the original rupture of blood-vessels and extravasation of blood into the tissues.

PROLAPSE OF THE URETER.

An unique accident is reported by Caillé, consisting in a prolapse of the inverted lower portion of the right ureter of a child two weeks old through the urethra. The child was a female, and after chloroform had been administered the prolapsed portion was reduced. On the twelfth day the protruding sac was removed, and the child died in twelve hours. An autopsy showed that the right kidney was the seat of cystic degeneration, that both kidneys were the seat of interstitial nephritis. A small warty or papillomatous growth was found in the right ureter near its vesical insertion; this had caused partial occlusion of the ureter; then the tumor was forced by the *vis a tergo* into the bladder, and thence through the urethra; as it passed along it dragged with it the lower portion of the ureter, and this it was which projected in the form of a sac.

CONVULSIONS.

Simon lays down as a primary proposition⁵⁵_{Mar.3} that in every case of convulsions one should first inform himself of the condition of the urinary secretion. In eclampsia the secretion of urine is

entirely suspended, though there may be ejection of that which was in the bladder prior to the convulsion. As soon as the discharge of urine becomes quite abundant it is evident that the kidneys have commenced work again and that active treatment can be discontinued. An abundant discharge of urine in eclampsia, as in some other nervous disorders, may, therefore, be looked upon as a critical phenomenon which announces with certainty the speedy termination of the convulsive attack, though there may be a few more spasms before the attack is entirely over. Simon does not indorse Trousseau's plan of avoiding all active treatment for convulsions. To Trousseau's objection that mustard baths and similar means only irritate the patient, the obvious reply must be made that while a child is in convulsions it is entirely insensible and unconscious, and hence the therapeutic means which may be used cannot then excite irritation. In the treatment of convulsions one's attention should first be directed to the alimentary canal, an enema being administered with glycerine or some other appropriate agent. Vomiting should then be excited by tickling the throat with a feather or administering a suitable quantity of syrup of ipecac between the spasms. Should such means be inefficient an enema may be given containing

R Soda sulph.,	. . . . .	15.00	grams (℥ss).
Fol. sennæ,	. . . . .	4.00	" (5j).
Aquæ,	. . . . .	200.00	" (℥viss).

This treatment failing to produce the desired result, inhalations of ether or chloroform may be used, and continued as long as may be deemed advisable. With the inhalations or during the intervals between inhalations air containing the following may be given:—

R Chloral hydr.,	. . . . .	0.50	grams (gr. viiss).
Tinct. moschi,	. . . . .	gtt. x	(gtt. x).
Aquæ,	. . . . .	50.00	grams (℥j and ℥v).

This may be administered in two portions with a glass syringe. Should the attack still persist the child must be immersed in a warm mustard bath. This will cause fluxion to the skin and diminish the circulatory trouble which always accompanies eclampsia.

DIETETICS OF INFANCY AND CHILDHOOD.

By LOUIS STARR, M.D.,

AND

W. M. POWELL, M.D.,

PHILADELPHIA.

BREAST FEEDING.

IN connection with the above subject, the paths that investigation has recently followed have tended in several directions, namely, the determination of (*a*) the influence of diet upon the function of milk secretion, whether of the mother or wet-nurse; (*b*) the effect of bathing before lactation; (*c*) the influence of a woman's age upon her milk; (*d*) the alterations in the composition of human milk as lactation advances; and (*e*) the effect of certain drugs upon the milk of nursing women, and through this upon the nursling.

(*a*) Zaleski,⁴ Jan. 23 & 30 one of the latest workers in this field, after a careful analysis of the proximate constituents of human and animal milk under various dietetic conditions, has arrived at the following conclusions: 1. Milk containing an undue proportion of fat may have a very injurious effect upon the infant. 2. Highly nitrogenous food produces a marked increase in the fat of the milk and reduces the proportion of milk-sugar, but has little influence over the other constituents. The same results are produced by alcohol. 3. Milk of good quality is secured by the employment of proper food.

These conclusions are opposed to the practice of the laity, especially so far as wet-nurses are concerned. The wet-nurse, as a rule, is a highly privileged being, who must be allowed an unlimited quantity of butcher's meat and a good supply of ale and porter. The exercise she takes is usually a gentle saunter at her own sweet will, and is utterly insufficient.

In addition to the directly injurious results of an over-albuminous diet, the effect of forced feeding upon a woman who has probably been underfed before assuming her foster duties

must be remembered. Zaleski cites a case in point in which a chemical analysis of the milk revealed over 6 per cent. of fat, and from an inquiry made as to the condition of the child it appeared that it had been ailing ever since the services of the wet-nurse had been called into requisition. The latter was a poor girl, whose diet and whole course of life was changed when she became a wet-nurse, and that this injuriously affected the lacteal secretion was proved by the fact that her own child had been far from well since then. An immediate return to the previous mode of life was ordered with the best results.

In connection with some experiments to be mentioned later, Dr. Kolesinsky¹⁹⁰¹ studied the comparative influence of a dietary devoid of flesh, milk, eggs, and butter, and an ordinary mixed diet, on the composition of the milk of the same woman. The following table, embracing the average figures from observations on five women, shows the results arrived at:—

	Restricted Diet.	Ordinary Diet.
Specific gravity	1.0312	1.0280
Water	88.34 per cent.	85.80 per cent.
Dry residue	11.66 "	14.20 "
Proteids	1.86 "	2.29 "
Fats	3.41 "	5.17 "
Sugar	5.72 "	5.60 "

In other words, the sparse diet makes the woman's milk thinner and more watery and decreases the proportion of proteids and fats, while the amount of sugar remains much the same. Hence, "both the suckling infant's and suckling woman's interests strongly demand that the custom of keeping frequent fasts should be brought down to a possible minimum."

Dr. W. I. Thayer, of Brooklyn, N.Y.,^{192 June} has offered a very good suggestion in regard to diet during gestation. He writes in somewhat the following words: "The expectant mother should early in gestation begin to eat, at least three times a day, some form of coarse cereal foods, such as oatmeal, Graham, rye, or Indian breads. These articles, being made from the *unbolted* products of the grains used, contain a much larger proportion of lime salts than the preparations of fine bolted flour of ordinary employment. The result is that the mother supplies her offspring, first through the umbilical cord and afterward through the

mammary glands, with a pabulum containing essential elements for the nutrition of a very important set of organs, namely, the teeth. Not enough attention has been given to the facts that the teeth are useful to assist in articulate speech, to maintain the natural contour of the face, and, above all, to comminute the food, and thus assist in easy and perfect digestion."

To accomplish these ends the teeth must be sound, and soundness cannot be secured unless a pabulum containing all the elements for dental structure be supplied. This, too, must be supplied from the time of the commencement of the development of the teeth, about the sixth week of intra-uterine existence. Hence the advantage of the plan suggested.

(b) Kolesinsky has thrown some defining light upon the effect of the bath on milk secretion.

He selected for his experiments fifty-four robust wet-nurses belonging to the staff of the St. Petersburg Lying-in Hospital. These women varied in age from twenty-one to forty-two years, and the age of the milk at the time of beginning the experiments ranged between twenty-one and three hundred and sixty-five days. Each nurse was supplied with a healthy, energetically sucking infant, aged from six to twelve months. The breast was presented every two and a half hours from the morning up to 11 P.M. On each occasion the child was carefully weighed (with all its clothing) both before and after suckling. The difference found, plus the amount of milk extracted from the breasts by subsequent mechanical means, showed the whole quantity of milk present in the nurse's mammary glands at each feeding. The sum obtained from all procedures of the kind during a day gave the daily secretion of milk in each case. Each experiment lasted six days, for the first three of which the woman took no baths, while for the remaining three she daily took a bath after the usual Russian manner, that is, she first washed herself with soap and hot water in the bath-room at the temperature of 24° C. (75.2 F.) or 26° C. (78.8 F.), and then "steamed" herself in the vapor-room at the temperature of about 40° C. (104 F.), the whole process lasting from thirty to forty-five minutes. All other conditions of the woman's life remained as identical as possible during both of the periods. In thirty-seven of fifty-four women not only the daily amount of milk was determined, but also a quantitative analysis

was made both before the first and after the third bath. The specific gravity was determined by means of a pycnometer, fats by means of weighing a dry residue after treating with ether, albuminoid bodies after Palm's method, and sugar by means of Fehling's solution (applied to a filtrate obtained on the determination of albuminoids). The following table contains some average figures from the author's tables:—

	Before Baths.	After Baths.
The daily amount of milk in grammes . . . . .	.577 (3xviiiiss)	.629 (3xx)
Specific gravity	1.0301	1.0296
Water	87.87 per cent.	87.56 per cent.
Solid residue (in general)	12.13 "	12.44 "
Albuminoid substances	2.08 "	2.17 "
Fats	3.25 "	3.61 "
Sugar	5.55 "	5.68 "

That is, the bath increases the secretion of milk, the average surplus being 52 grammes (3j and 5v) or 8.2 per cent. In some cases the surplus amounted even to 113 per cent. In eleven women, however (18.6 per cent.), the daily amount of milk was lessened by the baths, the decrease varying from 0.37 to 24.7 per cent.

The general conclusions are: 1. Suckling does not represent a contra-indication for the use of Russian baths. The latter, therefore, may be freely allowed to the wet-nurse, and even may be recommended to her as an important means for preserving personal cleanliness and for encouraging a regular action of the skin (provided the woman has no eczema, etc.). 2. The bath may be, to a certain degree, regarded as a galactagogue. 3. In a majority of instances the bath increases not only the daily amount of water, but also that of the solid constituents of the milk.

(c) The authority already quoted furnishes a third table to show the influence of a woman's age upon the composition of her milk.

Number of observations	5 22-25	18 15-30	5 30-35	6 35-40
The woman's age				
Specific gravity	1.0296	1.0304	1.0294	1.0299
Water in per cent.	87.48	88.08	87.44	87.72
Dry residue in per cent.	12.52	11.92	12.55	12.27
Albuminoids "	2.32	2.09	2.03	1.95
Fats "	3.80	3.32	3.69	3.46
Sugar "	5.52	5.51	5.30	5.82

The chief alteration is in the albuminoids, which are gradually diminished as age advances.

(d) Another interesting series of observation by Kolesinsky may be tabulated here. They illustrate the alterations in the composition of human milk as lactation progresses:—

Number of observations Months	5 I.	10 II.	2 III.	3 IV.	3 V.	5 VI.
Specific gravity . . .	1.0311	1.0302	1.0313	1.0281	1.0282	1.0303
Water	88.10	87.69	88.12	87.00	87.36	88.43
Dry residue	11.89	12.31	11.87	13.00	12.64	11.57
Albuminoids	1.94	2.24	2.17	2.22	2.29	2.01
Fats	3.00	3.76	2.55	3.62	3.63	3.49
Sugar	5.51	5.53	6.00	5.32	5.40	5.43

Number of observations Months	2 VII.	4 VIII.	1 IX.	1 X.	1 XII.
Specific gravity	1.0291	1.0299	1.0301	1.0311	1.0293
Water	87.30	88.10	87.34	88.00	87.60
Dry residue	12.70	11.90	12.66	12.00	12.40
Albuminoids	2.17	1.97	1.80	1.95	1.97
Fats	3.67	2.88	3.01	4.06	3.52
Sugar	6.09	5.36	6.51	5.03	5.46

The table shows, therefore, that, beginning with the sixth month of the lactation, the percentage of the proteids becomes somewhat less. As to fats and sugar, their proportions vary only slightly.

(e) Professor Fehling ²²_{May 9} writes as follows:—

“This subject has been forcibly brought under the notice of the author by the mysterious death of an infant from an overdose of morphia, which seems to have been conveyed from the nurse through the milk. For some slight ailment of the nurse a small dose of morphia had been prescribed, and she noticed no effect from it to warrant the slightest anxiety. From the importance of the case the question was raised: What quantity of medicine can a nurse use without injury to a child? For the guidance of men in busy practice the author undertook the task of experimenting with different substances in the hope of arriving at some approximate limit for practical use, although this must necessarily be accepted as very arbitrary from the difficulty of measuring the power of absorption, the change in the circulation, and the freedom of elimination

by any of the other secreting and excreting organs. All soluble agents, he finds, pass from the circulation through the milk to the child."

Professor Fehling found:—

1st. That salicylate of sodium greatly increases the secretion of milk, and becomes dangerous to the infant after the administration of three grammes (thirty-five grains).

2d. Iodide of potassium is not separated from the blood by the lacteals for some time after the commencement of its use, and is present in the milk for more than twenty-four hours after the nurse has ceased taking it; 0.2 grammes (three grains) may be administered daily without any bad effect upon the child.

3d. Ferrocyanide of potassium has negative effects upon the infant even after doses of two grammes (thirty grains) are given.

4th. Iodoform passes very readily from the circulation of the mother into that of the infant. Thus, if a wound of the mother be dressed with iodoform the urine of the child will be highly charged with the drug before it appears in the mother's urine.

This, Fehling thinks, is proof that iodoform is decomposed in the blood and passes off easily by the lactic glands, to the great risk of the infant. On the other hand, if a child's wound be dressed with iodoform no bad effects will accrue. Thus, he found that if the navel of an infant be daily dressed with iodoform for at least eight days no constitutional effects of the drug could be observed.

5th. There is no direct transmission of the salts of mercury.

6th. Moderate doses of morphia, either by the mouth or hypodermatically, have little effect upon the nursing.

7th. With chloral no effect upon the child was noticed when the breast was withheld for one or two hours, and this even in weak and puny children.

8th. Atropia must be used with great care, as it is easily transmitted to the child through the nurse's milk.

9th. The author also discusses in his paper the relationship that exists between the nurse and the child, and thinks that it is improbable that a nurse can impart her disposition or character to the child by the medium of the milk alone, though he admits that many diseases are likely to be transmitted by this means. He thinks, however, that mothers with any tendency to mental dis-

orders or epilepsy should not suckle their own offspring. If this precaution be not taken he assumes that the disorder will be transmitted unaltered. This assumption lends some credence to the belief that the early nutrition administered to the child has some influence over its destiny. It is condemned as a false notion, however, to suppose that the temperament or corrupt disposition of a nurse can be transmitted to the child in the same manner as disease.

HAND FEEDING.

In discussing the question of the artificial feeding of infants we will endeavor to point out only the new features in connection with the subject, and avoid all matters which have become common professional property.

Kefir.—Among the various substitutes for breast milk, a material called kefir has received considerable attention. This substance is the product of fermentation of cows' or goats' milk. The process of its production is analogous to that to which mares' or asses' milk is subjected in the manufacture of genuine koumiss. Practically, however, there is a great difference between the two substances, for, as cows' milk is readily procurable throughout the civilized world, kefir can be made everywhere; whereas, on the other hand, mares' or asses' milk being difficult to obtain, reliable koumiss (koumiss made by the addition of sugar and bread yeast to cows' milk is a mere imitation and a very different article from the original koumiss of the Tartars) is a rare article.

Kefir has been used for ages among the Caucasian tribes, but the attention of the medical world was not called to it until about ten years ago, when Russian physicians, having obtained the ferment, began to experiment with it. These experiments attracted the attention of the Germans, and through them we have our present knowledge.

The kefir ferment, according to Taylor, consists of three varieties of bacteria, the *Bacillus caucasicus*, the *Saccharomyces mycoderma*, and the *Bacillus lactus*. All of them are found in the so-called "kefir beans," or small particles of dried ferment held together by a gelatinous substance.

When properly made, kefir should be rather thick, of uniform consistence, and free from lumps; it should contain more or less carbonic acid gas, which forms bubbles on the surface that persist

for some time, and its taste should be sour, but not acid, being even less acid than that of buttermilk, which it resembles. When kept for two or three weeks it becomes so acid as to set the teeth on edge and is very unpleasant to the taste. If an old bottle be uncorked, quite two-thirds of its contents will fly out and be lost, and the remainder will be blown up into large bubbles by the sudden evolution of carbonic acid gas.

Analysis shows that, after thirty-six or forty-eight hours' fermentation, kefir contains less casein and milk-sugar than fresh cows' milk, while alcohol (5-15 to 1000), lactic acid, hemi-albumen, lacto-syntonin, and peptones are found as the result of fermentation. As the fermentation goes on more of the casein is digested, and the conversion of sugar-of-milk into alcohol, carbonic acid gas, and lactic acid continues. The remaining casein is precipitated in light flakes, the size of which is not increased by the action of the gastric juice.

Kefir is, therefore, a partially digested milk, which fulfills an important indication in infant-feeding, namely, the breaking up of the curd of cows' milk without introducing indigestible matter into the infant's stomach.

As the casein of cows' milk is exactly the same as that of human milk, the difference in the curding must be due to something which is found in the one and not in the other. According to the recent investigations of Schmidt, this is due to the presence in human milk of hemi-albumen in proportionately larger quantities than in cows' milk. In order to impart this same quality to cows' milk a common plan is to dilute it with some thick fluid. For this purpose solutions of gelatine, barley-water, rice-water, etc., are usually but not always successfully employed.

In kefir one has the soluble forms of albumen due to the action of the ferment, and, consequently, the light, flocculent coagulation. Theoretically, then, we should have in kefir one of the very best foods for infants, if lactic acid, carbonic acid gas, and alcohol are not contra-indications. Lactic acid is found in the stomach in the normal digestion of the sugar-of-milk, and its presence can but assist in the digestion of the casein. Carbonic acid gas rather increases the secretion of the glands, and alcohol in a dilute solution is a tonic and stimulates digestion and nutrition.

Taylor, from whose paper the bulk of what we have written

has been taken, has had most excellent practical results from kefir in the treatment of simple atrophy and diarrhœal affections. He states that at first the majority of children do not like it, but that the addition of a little sugar soon overcomes the distaste, and that then they rather prefer it to cows' milk. The sugar may be omitted after a day or so. It is worth mentioning that a slight diarrhœa usually follows its first administration, but this quickly subsides without treatment.

Its effects may be summed up as follows: 1. During its use the quantity of urine is increased, but only in proportion to the quantity of fluid consumed. 2. The specific gravity of the urine diminishes. 3. Nitrogenous changes are checked. 4. Digestion is strengthened and stimulated in even the worst forms of indigestion, and the nutrition of the body is improved. 5. The gain in body-weight is rapid and enormous. 6. The number of red blood-corpuscles increases.

Kefir is, according to the author quoted, to be regarded as one of the most valuable aids known in building up or retaining the power of the body in all conditions of great general debility. So far as its administration is concerned, the following rules are to be remembered: 1. If the infant be less than a month old it should be given diluted one-third with water. This proportion may be gradually lessened until at from four to six weeks of age, when it is given undiluted. 2. It should be fed slowly from a simple, easily cleansed nursing-bottle. 3. When used it should constitute the only food, except in children over a year old, when crackers, toast, etc., may be given with it, and one meal a day can with advantage consist of oatmeal-mush or other farinaceous food. 4. For young infants it is best in its fresh state. As the child grows older, fully fermented kefir may be used.

Its greatest usefulness is in cases of infantile atrophy and chronic diarrhœa, and it will undoubtedly prove to be a valuable addition to our resources in the care of hand-fed infants.

Brush⁵¹_{July} quotes Dr. Barry as stating that "the kefir grains are in their first living state white bodies, usually of an irregular, roundish form, equal to or exceeding a walnut in size, chiefly composed of rod-shaped bacteria and numerous groups of sprouting fungi, living and growing in company with the bacteria. The kefir ferment, though its origin was at first supposed to be involved

in mystery, consists, then, mainly of a mass of micro-organisms procured from the dirty, skin milk-sacks of an uncivilized, filthy people.

"The strangest part of the kefir craze was the discovery by Alexander Levy, in 1886, that effervescing alcoholic kefir can be procured without any kefir grains whatever by simply bottling the milk and shaking it with sufficient violence while it is turning sour. This form of fermented milk gives nearly double the percentage of alcohol that is obtained from milk to which the kefir grains have been added."

Brush is of the opinion that Taylor in the preceding article is right in his observations of cases, but it is a well-known fact in all hospital experience that in the trial of all new preparations, no matter what the ultimate result may be, the patients seem to get better, and the explanation of this is plain enough to any physician who has practiced in a hospital, that while patients are under observation for the trial of new treatment the care and attention given them is always much greater than that bestowed on patients undergoing a routine method of treatment. Taylor also states that the presence of lactic acid has a germicidal action upon a large class of micro-organisms, and thus acts as a purifier of the milk. In the opinion of Brush this is decidedly wrong. He states that lactic acid in milk is not a purifier, it is simply a forerunner of putrefaction. Lactic acid in food must always be looked upon as a dangerous body; it is a far different substance when used medicinally in its free state than it is in combination with nitrogenous bodies undergoing fermentative changes resulting in the production of dangerous alkaloids.

We fully agree with the conclusions of Dr. Brush.

PREPARED INFANT FOODS.

Condensed Milk, etc.—Dr. Simon Baruch¹⁹¹_{July} writes that experience has demonstrated that condensed milk is not a good food for infants, because its composition varies (1) according to the state of concentration; (2) owing to the addition of cane-sugar; (3) according to the season of the year in which it has been manufactured, and (4) according to the place from which it is sent to market.

The fluctuation is as follows: Water, 20 to 30 per cent.;

fats, 8 to 12 per cent.; albuminoids, 10 to 13 per cent.; milk-sugar, 10 to 15 per cent.; cane-sugar, 30 to 45 per cent., and salts, 3 to 15 per cent.

The conclusion is "that the supply of albuminoids in condensed-milk food (ordinary solution) is insufficient to furnish the normal quantity of blood, besides supplying that which is used up in its own conversion in the body. As the oxidation of sugar and fat are both dependent upon the red blood-corpuscles, which are oxygen-carriers, the conversion is diminished with the blood volume; more fat remains over than would be the case if the normal quantity of albuminoids were present. Children fed on the ordinary solution of condensed milk, therefore, take on more fat, absorb more water into the tissues, and produce less blood and muscle. Hence, they cannot resist disease, and while they appear well nourished they are anæmic, lymphatic, and readily become scrofulous if the tendency exists. From physiological and medical stand-points the exclusive nutrition of infants on condensed milk is not to be commended. Whosoever wishes to use it should dilute it with skimmed milk instead of water" (H. von Liebig).

Professor Cornwall,¹¹⁹_{Apr.} confirming the statement of Liebig, gives even a more damaging average.

If the solution of condensed milk upon which Liebig's calculations are based (one to six of water) furnishes only one-half the albuminoids derivable from an equal quantity of human milk, how absurdly small is the actual amount of albuminoids which all babies obtain from the usual solutions of one to twelve or fourteen, popularly adopted in this country for infant-feeding? The small amount of casein present in this popular solution of condensed milk accounts for the fact that very young infants sometimes digest it better than the regulation cows' milk dilutions.

Aside from the disadvantages of condensed milk here set forth, the most important point in this connection is that, being prepared in a temperature far below the boiling point, the milk is not sterilized before being boxed up. Gautier,²_{Nov. 2, 1887} has shown by culture experiments that germs are not destroyed by condensing milk or manufacturing it into cheese, etc.

It follows, then, that ordinary condensed milk fails in every essential demanded for a good infants' food. Hence, it cannot be sufficiently condemned, except as a temporary expedient.

The same author also states: A second class of prepared foods are certain starch and malted preparations which claim to form a good infants' food by their addition to cows' milk. So much has recently been written on this subject that it will not be profitable to enter into the physiological points involved. One point of importance which has hitherto been somewhat overlooked is the fact that, as milk is the chief constituent of these foods, the milk used for this purpose should be thoroughly sterilized before being added to the "food." In the paper referred to above it was shown how difficult this process must be with the means at present at our command. Hence, these "foods" must be used with great caution.

Milk-foods.—A third variety of prepared foods are the so-called milk-foods, consisting of desiccated milk, sugar, starch, and dextrin. These are the most important foods for infants to-day, because they furnish the essential elements of nutrition chiefly derived from milk whose casein has been predigested and rendered more soluble by the addition of pancreatine and dextrin.

Physiological justice demands that these foods contain no raw starch if they are to be used for infants under six months, that they contain no grape-sugar, that they be supplied with an appropriate quantity of milk-sugar, and that the protein constituents be not less than those of human milk. That even some of the most celebrated of these foods do not meet these requirements may be gathered from an analysis ¹⁰⁰⁰_{Vol. 6, p. 557} in which a German preparation, very popular in this country, is stated to contain only two per cent. more proteids than condensed milk, and, besides 42.42 dextrin, contains also 33.40 "starch-flour." *Its nutritive power is put down as equal to condensed milk.*

But not alone do we demand that these so-called milk-foods contain the equivalent of the solids in human milk, and especially of the albuminoids derived from milk, but that the latter be gathered with the utmost care from properly fed animals, transported with the least possible jolting to the factory, maintained during its transit at a low temperature, then transferred to an apparatus for sterilization, and, immediately after the latter has been accomplished, reduced to the dry state in order to prevent the formation of those organisms which Loeffler, Pasteur, and Lester have found to develop in fluid milk after boiling under an

alkaline reaction. If such a preparation be put into air-tight and sterilized jars all will have been accomplished that can be done to render the food sterile and thus fulfill the chief indications in the prevention of the most serious gastro-intestinal derangements.

A perfect infants' food is still a *desideratum*. Such a food will probably be evolved from the mind of some manufacturer who understands the physiology of infantile digestion and of the chemistry of milk. A substitute for human milk, to approximate the latter closely, should be made entirely from cows' milk, without the addition of any ingredient not derived from milk. Until this consummation is reached we must be content with milk-foods known to be derived from pure sterilized cows' milk, whose casein has been partly predigested, and to which no injurious ingredient has been added for the purpose of aiding digestion or increasing the nutritive properties.

Such a food is superior to cows' milk *as now obtainable, i.e.*, unsterilized and subjected to damage by rough transportation; and it is also, for the same reason, superior to any prepared food that requires the admixture of milk before ingestion. Such a food, too, would have the advantage of being easily and rapidly prepared by addition of sterilized water, affording an altogether sterilized food.

C. W. Earle⁶¹_{Aug. 4} says the great trouble in the use of condensed milk is that not enough is used. It should be remembered that milk is only condensed four times, and that a small amount will color a very large amount of fluid, as one teaspoonful is said to color twelve ounces of water. In Dr. Earle's experience the youngest infant will take condensed milk in the proportion of one to ten or fifteen, that is, barley- or rice-water, ten to fifteen parts; condensed milk, one part; sugar-of-milk, salt, and the phosphates. Even this will only be sufficient for a short time, and one must soon either add more condensed milk or to the same food cream. The agreement with each individual case, in less or increasing quantities, is the only safe rule for our guidance.

Fresh Condensed Milk.—Dessau⁵⁹_{Aug. 25} divides condensed milk into two kinds: the *plain* or fresh, and the *preserved* or canned. The plain or fresh variety that is served from the company's wagons should only be employed. It is generally recognized by authorities that cows' milk is the best and most available substitute for the mother's milk. The objections to its general use,

however, are that during the summer months it is impossible to obtain it fresh and unadulterated in large cities, unless at a cost beyond the income of the masses. Most of the milk that is delivered in the market is at least from twelve to twenty-four hours old and has undergone rough transportation of from fifteen to thirty miles in cans that are probably not clean. These cans are often not cleaned until returned to their owners. When the milk has reached the poorer classes it has commonly undergone more or less adulteration, often in spite of the closest watching by the health authorities. In course of its consumption by the average infant it is still further liable to lactic acid fermentation, and even though boiled it is not unlikely to become scorched or made otherwise unwholesome for the infant.

For infants living in small towns, where a fair quality of cows' milk can be procured fresh, these objections need not apply, provided that a reasonable amount of care is observed in keeping the various utensils for holding the milk clean and the milk cool.

In view of these deficiencies there can certainly be no valid reason against the more general use of the *fresh* condensed milk as a substitute for cows' milk for infants living in large cities, when the manner of its preparation is more widely known. In the first place, it is impossible to adulterate condensed milk; the quality and the purity of the milk employed in its manufacture is of the best; the milk used is delivered under strict contract. Besides that, the various dairies are inspected at frequent intervals by agents to see that the terms of the contract are not violated. This milk is obtained from a large number of cows, which makes it far preferable to the milk of one cow, and, contrary to the statements of some writers, no cream is removed from the milk before condensing.

In the process of condensing the milk is exposed for an hour or more to 210° F. (99° C.) of heat under pressure, which, according to Soxhlet, is sufficient to destroy any germs it might possibly contain, thereby rendering it practically sterile. The condensing process alters the casein in such a manner that it appears, when properly diluted thereafter, to coagulate in the infant's stomach more like the casein of mothers' milk, in light flakes, instead of firm, hard masses, so often experienced with cows' milk.

Fresh condensed milk, which has *no cane-sugar* to preserve

it, will remain fresh from two to six days in an ice-box or refrigerator, which is long enough for all practical purposes.

An important advantage in favor of condensed milk is the fact that it can always be diluted *in any desired proportion*, to suit either the age of the child or the power of its digestive apparatus. It is never known how much ordinary cows' milk has previously been diluted. It has been suggested as an objection to the use of condensed milk that it requires too much dilution, it being supposed that it has been reduced one-fifth in bulk. Cows' milk for infants under six months old should be diluted to one-half with water; condensed milk will require four parts of water to bring it to the standard of fresh cows' milk. If this is now diluted again one-half, seven parts of water to one of condensed milk would have to be used for an infant under six months old. An infant should commence with one to sixteen parts, and after the sixth month the condensed milk may be increased from one-half to double the quantity.

It is often said that though a child thrives on condensed milk, if it becomes ill it loses fat rapidly. This may apply to the canned milk, but as to the fresh condensed milk, there are certainly no just grounds for such statements. The elements of nutrition are precisely the same as in fresh cows' milk; the amount of water is the same as it is commonly used for the purpose of preservation, there is *no addition of sugar*, and infants fed upon fresh condensed milk do not lose fat any more rapidly when taken ill than those fed upon the breast or upon fresh cows' milk.

Artificially Digested Milk.—In reviewing the subject of the artificial digestion of milk in the hand-feeding of infants, we have observed a tendency, especially in the report of the Committee on Infant Feeding, American Medical Association,⁶² to regard the process as impracticable in the household and as unphysiological, because it calls for no digestive effort on the part of the alimentary tract, weakening its powers, so to speak, by overcoddling. Personally we must differ from these conclusions, as we have many times seen it save life, and regard it as a great aid to the child's physician.

At the same time, peptonization, like any other active therapeutic measure, must be used with judgment. Every one who has seen much of infants must have met with many cases, usually of

simple atrophy, in which the digestive powers are entirely lost,—in which, in other words, the secretions from the alimentary tract seem to have no potency. How is this potency to be obtained? Undoubtedly by increasing the systemic strength by food. But food, however nutritious, can do no good unless it is so altered by the digestive ferments that it can be absorbed.

Recognizing this, there is no use in pouring into an inactive canal even the most skillfully combined and nutritious—but at the same time undigested—food that man can devise, for it will never be absorbed. On the other hand, let us suppose that with the natural ferments that modern science has furnished us we do outside of the body what nature under normal circumstances does in the intestinal canal, and administer the product to the child. What is the result? The hungry blood-vessels drink in the predigested food, and the starving tissues are thankful for the artificial aid—so thankful, indeed, that they make a return, and gradually the gastric glands, supplied by a better quality of blood, begin to secrete an active fluid. Then the artificial, aided by the natural digestion, rapidly increases the general strength and improves nutrition. Now comes the point. So soon as natural digestion is established—and this is a question easily decided by an experienced physician—artificial digestion becomes unnecessary and should be discontinued, just as one would discard a splint from a mended fracture or suspend drugs on the establishment of convalescence from any disease. One would not think of predigesting milk for an infant who possessed normal digestive powers.

As to the impracticability of predigestion in the nursery, the non-success of the process must lie at the door of either the nurse, the mother, or the doctor, for with the tools we have at present “he who runs can read.”

STERILIZED MILK.

Caillé¹⁹¹_{Apr.} states that about twelve or thirteen years ago Dr. A. Jacobi recommended that milk for infants be boiled and placed into small bottles, tightly corked, and kept in ice upside down. Since then much attention has been given to the subject of preserving milk for infant feeding by Soxhlet, who has prepared an apparatus for sterilizing which is used by over a thousand families in Munich.

Soxhlet says: "During the process of milking, particles of manure and other forms of dirt get into the milk, and during transportation and general handling fermentation sets in, so that much of our milk is really unfit for consumption before it gets into the hands of the consumer, *i.e.*, into the stomachs of infants and children. Mothers' milk, on the contrary, is taken directly, and would undoubtedly be equally contaminated and frequently injurious to infants if it suffered the same manipulation as cows' milk." He also quotes the well-known fact that calves fed on milk from a trough frequently suffer from diarrhœa. Dr. Soxhlet proposes, therefore, to sterilize all milk for children's use, and his method is as follows:—

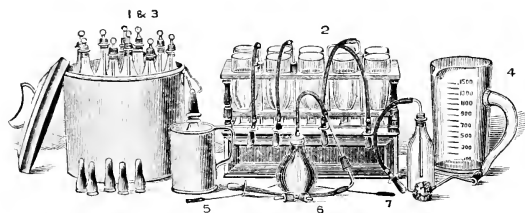
Description of Sterilizing Utensils.—1. Twenty well annealed five-ounce bottles with stoppers of rubber and glass combined. Each rubber stopper fits well into the neck of the bottle and is perforated in order to admit a slender glass stopper. 2. Wooden stand with zinc dripping-pan for inverted reserve bottles, and provided with a drawer for extra corks, tips, etc. 3. A tin or galvanized tray for ten bottles of milk, which fits into a tin pot half full of water, which is made to boil in the ordinary way. 4. A graduated glass pitcher for mixing the milk with water, etc., in certain proportions. 5. A water bath for warming each bottle of sterilized milk before using it, consisting simply of a tin cup with perforated double (inner) bottom. 6. Bag-syringe with nozzle for injecting soda solution through feeding-tubes, when such are used. Finally, bristle brushes for cleansing bottles, tubes, etc.

Mode of Sterilizing Milk.—Ten bottles are filled with milk to within half an inch of the neck. Into each bottle a perforated rubber stopper is pressed. The bottles are placed in tray No. 3 (see cut), which is set in a pot of water. After the water has come to a boil and expansion has taken place the glass stoppers are pressed into the perforated rubber stopper, thus hermetically closing each bottle. The milk remains in the boiling water from fifteen to thirty minutes, and is for that length of time under pressure in a temperature of 212° F. (100° C.), which is sufficient to destroy all germs and impurities liable to produce fermentation. Milk so prepared will keep sweet four to six weeks, according to Soxhlet.

When the milk is to be used the bottle is put into hot water for a few minutes until the milk is warm. The stopper is then removed and an ordinary rubber tip attached. Milk remaining in the bottle after the child has been fed should be thrown away.

The following are the indications for the use of sterilized milk: 1. It should be administered to all children deprived of the breast. 2. It is useful in cases of diarrhœa where ordinary boiled milk is not tolerated. 3. It is found very convenient while traveling with children.

Dr. Caillé made the following careful experiments in sterilizing and boiling milk: 1. Milk sterilized in Soxhlet's apparatus, which was boiled thirty minutes, remained good eighteen days. 2. Milk boiled in small bottles for fifteen minutes, the bottles being closed with a pledget of cotton before their removal from the boiling water, remained good five days. 3. Milk boiled in



STERILIZED MILK APPARATUS. (*Dietetic Gazette*.)

small bottles for fifteen minutes, then taken from the water and each bottle closed with a tight, non-perforated rubber stopper, remained good five days. 4. Milk boiled in small bottles for fifteen minutes, then taken from the water and each bottle immediately closed with a good quality cork stopper, remained good five days. 5. Milk boiled in a pot and put into small bottles after cooling, and closed with cork stopper, became sour after four days. 6. Milk boiled in a pot and put into small bottles after cooling, and closed with non-perforated rubber stopper, became sour after four days. [This milk was kept in a room with temperature ranging from 50° F. (10° C.) to 70° F. (21° C.).] 7. Milk boiled in a pot in the usual manner and left standing in an open dish in a room with a temperature of 75° F. (24° C.): store milk had a distinct sour taste and smell after eight hours; good

“bottle-milk” “turned” after fifteen hours. 8. Milk boiled in a pot in the usual manner and placed in an ice-box in an open dish: store milk “turned” after eighteen hours, bottle-milk after twenty-six hours.

Dr. Caillé's object was to ascertain as near as possible the point at which a change takes place in store milk under ordinary circumstances; this change should be perceptible to taste and smell—both good and practical tests of the condition and far superior to the litmus-paper test. The latter test is unreliable, inasmuch as milk which is just sour enough to be unfit for use will not turn blue litmus-paper red, such a change taking place only when the milk is very sour and curdled.

The milk used in these tests was of good quality, such as sold in any of the large cities for ten cents per quart. The sterilizing bottles were thoroughly clean, and all stoppers used were placed in boiling water before using.

After these experiments the writer has come to the following conclusions: 1. The sterilization of milk can be managed in any well-regulated household. 2. The boiling of milk from twenty to thirty minutes under slight pressure, in small bottles hermetically closed, is all that is necessary to practically carry out the principle involved in sterilization, *i.e.*, to destroy the germs of fermentation. 3. The essential materials are small bottles with Soxhlet's stoppers and a tray. 4. Milk boiled in small bottles for twenty minutes and instantly closed by a rubber, cork, or cotton stopper will not sour, if put on ice, for several days. 5. The boiling of milk in the old-fashioned way is faulty. All milk that is used by children should be boiled in small bottles in a water bath for twenty minutes, when it will keep much longer than if boiled in the ordinary way and the usual length of time.

Dr. Caillé does not think it necessary to use all the utensils that Soxhlet advises. The following will be found to be all that is needed, and can easily be packed in a box one foot square: Small bottles (five- to six-ounce, 155 to 187 grammes) with combination stoppers (Soxhlet's) and a tray of tin or galvanized iron, all procurable for a very moderate sum; a tin dipper, with perforated inner bottom, for warming the milk before giving it; ten spare bottles, with a few ordinary plain rubber tips. Feeding-tubes are impossible to keep clean and should never be employed.

We fully agree with the author in regard to feeding-tubes and believe that nothing but a plain bottle with straight rubber tip should be used. The English nursing-bottles with the rubber tubing usually have a metallic screw at the neck said to be "Britannia metal." Reimann⁵_{Aug.} examined a nursing-bottle with metallic fastenings and found 25 per cent. of lead in the metallic parts, and reference to the records of the Berlin Bureau of Hygiene revealed cases where liquids in contact with vessels containing less proportion of lead had caused lead-poisoning.

Rotch⁶⁵_{Aug.} suggests a simple apparatus for the sterilization of milk which can be made by any tinsmith at a small expense. It consists of a tin pail eight inches in diameter and fourteen inches deep, with a cover and handle, supported by three legs sufficiently high to allow a spirit-lamp to stand beneath; four inches from the bottom of the pail on the inside is a perforated tin diaphragm on which the feeding-tubes stand while being sterilized. Water is placed in the bottom of the pail, and when heated by the lamp the tubes are soon enveloped by steam. The feeding-tube is filled with milk, the nipple adjusted, as on any nursing-bottle, and then a strong rubber cot is drawn tightly over the nipple and brought down well over the tube, thus completely excluding the air. The tube is then exposed to the action of the steam in the sterilizer for twenty minutes. Dr. Rotch prefers a tube similar to a test-tube, with a foot, in place of a nursing-bottle. He has these tubes made of different sizes to correspond with the capacity of the child's stomach.

In regard to the measurements of the capacity of the stomach, we are not able, so far as we have experimented, to confirm the statements of Dr. Rotch. We have found great variations, as will be seen from the following cases:—

Case 1. Male child, æt. 3 months. Cause of death, simple atrophy. Stomach capacity, ten drachms (39 grms.).

Case 2. Female child, æt. 5 months. Cause of death, simple atrophy. Stomach capacity, seven ounces (218 grms.).

Case 3. Female child, æt. 6 weeks. Cause of death, simple atrophy. Stomach capacity, one ounce (31 grms.).

Case 4. Male child, æt. 5 weeks. Cause of death, syphilis. Stomach capacity, four ounces (124 grms.).

Case 5. Male child, æt. 4 months. Cause of death, simple atrophy. Stomach capacity, eight ounces (249 grms.).

Case 6. Male child, æt. 18 months. Cause of death, enterocolitis. Stomach capacity, fifteen and one-half ounces (467 grms.).

Case 7. Female child, æt. 16 months. Cause of death, enterocolitis. Stomach capacity, four and one-half ounces (140 grms.).

These measurements were made with the greatest care; in each case the stomach was thoroughly washed to clear it of food, etc., then filled with water, and the contents poured into a glass graduate. The reader's attention is especially called to cases 1, 4, and 5. There can be no question that the cause of death and the manner of feeding during life must greatly influence the results found on the post-mortem table.

Warner⁵⁹_{Sept. 1} recommends a domestic apparatus for the sterilization of milk. It consists of an ordinary cooking-steamer, which is filled to the height of two inches with water, which is brought to the boiling point; the milk which is the infant's allowance for the next twenty-four hours is placed in as many nursing-bottles as are employed during that period of time. These bottles, having been previously placed in an oven for fifteen minutes, are now stoppered with pledgets of cotton and put on the perforated plate of the steamer, not touching each other, the cover shut tightly down, and the whole allowed to steam for thirty minutes. Dr. Warner found milk to remain pure for five weeks after being sterilized as above. This, indeed, seems to be very practicable for mothers or nurses.

Raudnitz¹⁹_{Oct. 6} recommends the following method of sterilizing milk at the time of milking:—

The steam apparatus in the stalls for boiling the feed may be used to sterilize the glass bottles furnished with air-tight rubber stoppers. A covered wooden tub with shelves of perforated tin receives the bottles. By means of a pipe, steam is passed into the tub from below. Prior to milking, the udder of the cow, the milk-pail, and the hands of the milker are thoroughly cleansed. The milk is strained through clean linen directly from the pail into the sterilized bottles. Should a steam apparatus not be accessible, the bottles can be sterilized in a large covered vessel. Since introducing sterilized milk among his patients the author has seen no cases of diarrhœa.

Goats' Milk.—Richter⁴_{Apr. 30} recommends the use of goats' milk as superior to that of cows' milk. It has been plainly shown that

the milk of tuberculous cows can cause tuberculosis in the human subject. Goats offer a supply of milk which is nutritious, pleasant to the taste, and easily digestible, and do not seem to be so subject to tubercle as cows.

In cases of intestinal disease in children, Richter found that goats' milk agreed better and was more easily assimilated than cows' milk. Goats' milk contains less casein and three times as much soluble albumen as cows' milk, making it not only more easily digested, but also more nutritious.

The analysis of the three kinds of milk by Gorup-Besanez is as follows:—

In 100 Parts Milk.	Human.	Cow.	Goat.
Water	88.9	85.7	86.3
Solids	11.1	14.3	13.6
Casein	3.9	4.8	3.4
Albumen . . . . .	. . .	0.57	1.3
Butter	2.7	4.3	4.36
Milk-sugar	4.4	4.03	4.00
Salts	0.14	0.55	0.62

The junior editor of this department has given goats' milk to a number of children suffering from intestinal catarrh, dyspepsia, and simple atrophy. They had all been previously fed with cows' milk. The proportion of water added to the milk varied from six to two parts of water to one of goats' milk.

GAVAGE.

Dr. Paul LeGendre ⁶³_{Apr.} recommends gavage in premature children, and considers the following method, used by Tarnier, the most successful. The apparatus consists of an India-rubber catheter, No. 14 or 16, which is fastened to the neck of a small glass funnel. The child is placed in a horizontal position on the lap of the operator, the head being slightly raised. The end of the sound, wet with human milk, is held between the thumb and index finger, and is introduced into the mouth as far back as the base of the tongue. The child, by the reflex act of deglutition, generally brings it to the entrance of the œsophagus; if not, it may be conducted there by pressing the sound gently against the posterior wall of the pharynx, continuing the movement until the

sound has been introduced fifteen centimetres, being certain that it has entered the stomach. The tube is pressed between the index finger and thumb to regulate the flow, and the milk is gradually poured, fresh from the breast, into the funnel. When the latter is empty it is necessary to remove the sound quickly, so that the milk will not return through the tube. The child is then gently placed in the incubator.

LeGendre increases the quantity of milk in twenty-four hours. When the child becomes stronger, it should be given the breast, gavage and the nursing being alternated until its nutrition is perfect. Gavage should be continued three or four times a day in the intervals between the nursings. It is needless to say that the cleanliness of the funnel and catheter should be carefully attended to. By this method LeGendre hopes to be able to rear children born as early as the sixth month of gestation.

LAVAGE.

Epstein, of Prague,¹⁹³_{Jan. 2} has practiced lavage of the stomach in nursing children with good results. The apparatus employed consists of an elastic tube joined to a small glass tube, to the external extremity of which another piece of elastic tubing with a wide opening is adapted. This instrument may be introduced into the stomach a few days after birth without the least danger to the infant.

The lavage is practiced while the child is in the dorsal decubitus position, the trunk and superior member being enveloped in napkins. The child's mouth is opened by exerting a slight pressure upon the chin, while the larynx is slightly pressed inward by the index finger of the right hand. The tube having been previously dipped in warm water, it is held as a pen, and is slowly introduced, advancing by the simple, repeated act of deglutition. The contact of the sound with the stomach causes contractions of the walls, thereby expelling a quantity of liquid through the tube, which is depressed somewhat until the stomach is empty. The author employs distilled water with a little hydrocarbonate of soda, using from twenty to twenty-five grammes of the liquid for each lavage. The funnel-shaped end of the tube is raised to pour in the water and lowered to expel it. The washing may be

repeated two or three times in succession until the liquid returns nearly clear.

Lavage is indicated: 1. In cases of repeated vomiting. 2. In cases where there is present an affection of the mouth which is capable of extending to the stomach. 3. In cases of eclampsia caused by indigestible substances. 4. In cases of poisoning.

After the lavage the child should remain perfectly quiet for fifteen or twenty minutes before nursing.

GROWTH AND AGE.

By CHARLES SEDGWICK MINOT,

BOSTON.

THE progress of knowledge concerning our subject has been extremely meagre. Aside from paragraphs concerning centenarians, and so forth, three papers may be mentioned.

The first is that of Heidenhain²⁴⁶_{No. 34} upon the small intestine. He finds that the process of cell-division in the epithelium is confined to the fundi of the glands. Probably the new cells form and are gradually shoved by their successors up to the mouths of the glands and on to the villi, the tips of which, as is well known, often exhibit signs of disintegration in the epithelium. The view that the bottom of each gland represents a separate centre of growth has been suggested by Flemming,²⁹₁₈₈₅ and has been advocated by Bizzozero, who returns to the defense³¹⁶_{p. 751} of his opinion in a subsequent note. The growth of the gastric glands proceeds in this manner. I consider that the conception of centres of growth in epithelia, with its corollary of translation of the cells from their place of origin, represents an important advance.

The second paper is by W. Stephenson⁶_{Sept. 22} on the growth of children. His discussion of the rate of growth is based upon a misconception. He calls attention to the already known fluctuation in growth of boys from the tenth to the eleventh year, of girls from the eighth to the ninth. His special effort is to find a mathematical expression for the proper weight for each height at each age. He starts from the assumed proportion that the weight is to the height as the height is to some co-efficient, or, putting the initials for the words, $W : H = H : C$; hence, $H^2 \div W = C$.

The method generally employed of representing the relation of height and weight is by dividing the latter by the former, thus getting the value in pounds for each inch. This ratio, however, steadily increases with the height, so that for sixty-six inches we have a different ratio from that of sixty-nine inches: the one may be 2.05, the other 2.15. But the mind cannot tell by a glance at these numbers whether or not the shorter person is of equally good

weight proportional to his height as the taller man. When, however, by the method proposed, it is found that both have the same co-efficient of weight, viz., 32, it is at once evident that they are equally well favored in weight. The analysis of the statistics shows that the co-efficient of weight varies during the growing period according to the years, and this may be represented by substituting for C the expression $m-n$; n equals the age in years and m is a fixed number calculated by the formula $m-n = C$, or $m = n + C$. To me, Stephenson's method of expressing the relation of the height to the weight appears ingenious, but seems to present no real advantage over the older method, for he does not show that the co-efficient for each age does not vary with the observed height at that age.

The third paper is by Levasseur¹⁵²_{July 24} on the number of actual centenarians in France, census of 1886. The number of centenarians is much smaller than has been assumed ordinarily. Thus, in the Bavarian statistics of 1871 there were thirty-seven centenarians reported, but only one whose age could be verified. Again, in Canada, at the same epoch, of eighty-two reputed centenarians whose date of birth was ascertained only nine were over one hundred years old. In France the first returns of the census of 1886 reported one hundred and eighty-four centenarians. Further examination showed that one hundred and one of these were entered in the category erroneously. Of the remaining eighty-three persons, sixty-seven were assumed to be centenarians upon the assertions of their neighbors only. Only sixteen persons could attest their age by certificates of birth or baptism. One man of these sixteen claimed one hundred and sixteen years and nine months, which is much older than the highest authentic limit. Of the eighty-three centenarians the age, with this exception, ranged between one hundred and one hundred and five years. There were fifty-two women and thirty-one men. There were five men and sixteen women who had never married, twenty-three widowers, and forty-one widows. The number of births in France from 1771 to 1779 is calculated at nine hundred and forty thousand; accordingly, if we assume the number of centenarians at fifty, the people born in the period mentioned had each one chance in eighteen thousand eight hundred of living until 1886.

I have found no papers on the diseases of growth requiring mention in this report.

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By C. SUMNER WITHERSTINE, M.S., M.D.,

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STORAGE

